Service
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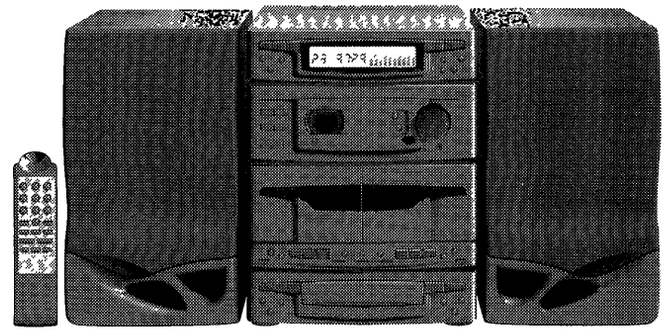
Volta ao Menu



Service Manual

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09/94

PHILIPS

SPECIFICATIONS

GENERAL

Mains voltage		Switchable110-127V / 220-240V for -/21
Mains frequency		60Hz
Mains breakdown protection		10 minutes
Clock Accuracy		< 4 sec/day
Power consumption		180W max
Dimension centre unit	**FW46**	240 x 309 5 x 273 5mm
	FW56	240 x 352 5 x 273mm

TUNER : FM SECTION

Tuning range		87 5MHz - 108MHz
IF frequency		10 7MHz
Aerial input		75Ω coaxial
Sensitivity at 26dB S/N		< 8µV {6 9µV}
Selectivity at 600kHz bandwidth		> 20dB {30dB}
IF rejection		> 50dB {60dB}
Image rejection		> 20dB {25dB}

TUNER : AM SECTION

Tuning range	MW	530kHz - 1710kHz for /21
IF frequency		
Sensitivity at 26dB S/N	MW	< 3 6mV/M {3 2mV/M}
Selectivity at 18kHz bandwidth	MW	> 16dB {20dB}
IF rejection	MW	> 24dB {24dB}
Image rejection	MW	> 28dB {28dB}

AMPLIFIER

Output power at 10% distortion		2 x 27W -1dB
Speaker impedance		2 x 6Ω L/R
Frequency response within -3dB		63Hz - 15kHz
Dynamic bass boost		+6dB at 300Hz
Headphone output at 32Ω		25mV
Input sensitivity	Aux/TV	400mV at 47kΩ
	MIC	1 5mV at 600Ω for -/21

CASSETTE RECORDER

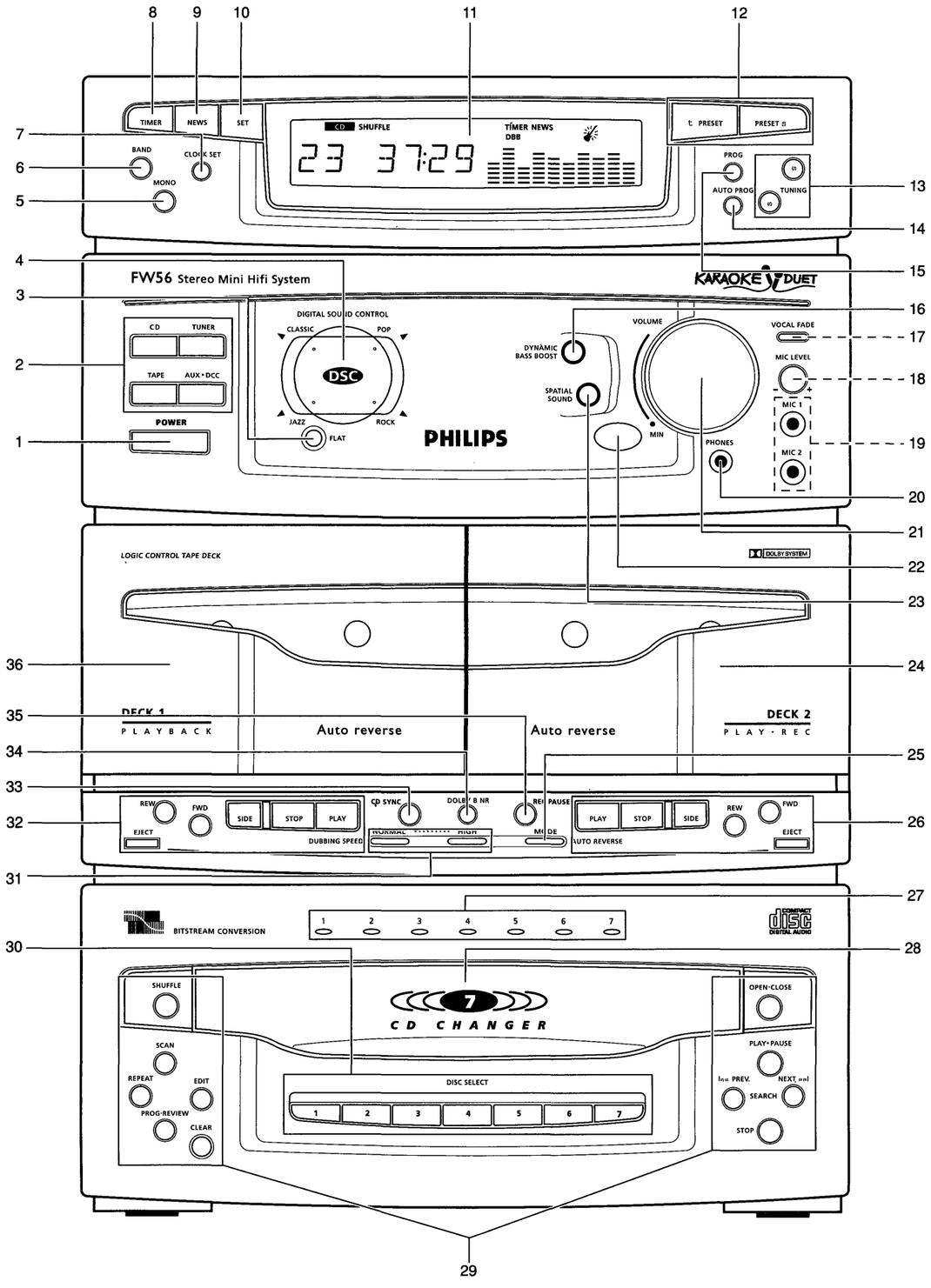
Number of track		2 x 2 stereo
Tape speed		4 76 cm/sec ± 2%
		1 7 x 4 76 cm/sec
Wow and flutter		< 0 4%
Fast-wind time C60		130 sec
Bias system		90kHz ± 5kHz
Recording playback frequency response within -5dB		80Hz - 12 5kHz
Signal to noise ratio	IEC I	> 47dB
	IEC II	> 47dB
	Dubbing	> 47dB
Dolby Noise Reduction Factor		8 5dB

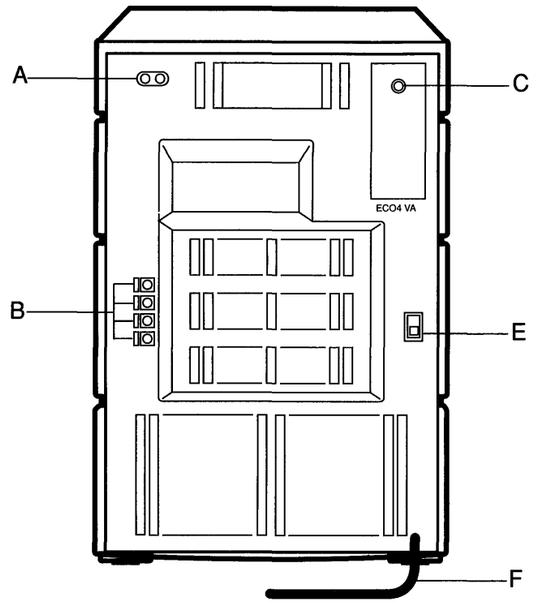
COMPACT DISC

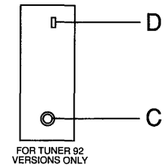
Frequency response within +2dB/-4dB	20Hz - 20kHz
Signal/Hiss ratio	> 75dB
Distortion at 1kHz	< 0 03%
Channel difference at 1kHz	< 2dB
Channel crosstalk at 1kHz	> 60dB
De-emphasis	0 or 15/50 µS (Switched by subcode on the disc)

{ } Values for /22 only

CONNECTIONS & CONTROLS







CONNECTIONS AND CONTROLS

1	Power		1414	27	Disc indicator		
2	Function controls	CD	1421	28	CDC Tray		
		Tuner	1426	29	CDC controls	Shuffle	1450
		Tape	1420			Scan	1451
		Aux-DCC	1410			Repeat	1459
3	Flat		1430			Program/Review	1458
4	Digital Sound Control	Classic	1431			Edit	1454
		Pop	1432			Clear	1455
		Jazz	1433			Stop	1456
		Rock	1434			Play/Pause	1460
5	Mono		1419			Open/Close	1452
6	Band		1425			Next	1461
7	Clock set		1418			Previous	1457
8	Timer		1424	30	Disc select		
9	News		1423	31	Dubbing speed	Normal	1472
10	Set		1422			High	1473
11	LCD display		1401	32	Play Deck controls	Eject	
12	Preset up/down		1428, 1429			Wind <<	1479
13	Tuning up/down		1412, 1416			Wind >>	1478
14	Auto program		1417			Side	1481
15	Program		1413			Stop	1474
16	Dynamic bass boost		1411			Play	1480
17 *	Vocal fade		1553	33	CD Sync		1475
18 *	Mic level		3673	34	Dolby B NR		1477
19 *	Mic inputs		1551, 1562	35	Record/Pause		1476
20	Headphone socket		1550	36	Cassette compartment 1		
21	Volume		3629	A	Aux-TV input		1552
22	IR sensor		6406	B	Loudspeaker sockets		1304
23	Spatial Sound		1415	C	FM antenna socket		1101 or 1110
24	Cassette compartment 2			D	AM antenna socket		1111
25	Mode		1471	E	Voltage selector		1281
26	Rec/Pb Deck controls	Play	1468	F	Mains cord		
		Stop	1470				
		Side	1469	* For Karaoke version only			
		Wind <<	1467				
		Wind >>	1466				
		Eject					

SERVICE TEST PROGRAM 1

Operating sequence	Display shows	Remarks	In case of problems check
Hold "Program" and "Preset Up" button down while Power on to enter Service test program	*XX YY-S #* This is the main menu	where XX - Type no numeric YY - Master µP version S - Service mode	
Press "Program"	*PASS* or *P* Main menu reappears after 2 seconds	Eeprom test	Check IC if Display shows *ERR* or *N*
Press "Autoprogram"	*NEW* or *N* Main menu reappears after 2 seconds	Eeprom is now reset to default data	
Press "Clock Set" Press "Clock Set" Press "Clock Set"	*32K* or *32* *8M* or *8* Main menu reappear	The Alarm buzzer is turned on An output signal of 4096Hz is available at pin 37 of the main µProcessor The output signal at pin 37 is now 3906 25Hz	Check X'tal Check 8MHz oscillator
Press "Set Timer/News"	*FAST* or *F* *NOM* or *N* Main menu reappears after 2 seconds	Pressing "Set Timer/News" key will alternate between Fast and Normal speed In the Fast mode the clock increases at 1 minute per second Leaving the test program now will allow quick customer checks on the clock/timer/alarm function	Ensure the clock is in normal speed before returning to customer
Press "Tuning Up" Press "Tuning Down"	*U* *D*	Volume turns clockwise slowlt until maximum Volume turns anti-clockwise until minimum	
Press "Mono" and followed by any key on the set or Remote control Press "Mono" to return to Main menu	See key test Table 1 and 5		
Press "News"	See Table 2 and Main menu	Pressing the "News" key will scroll through the 4 different displays and the Main menu	
Press "Timer"	*AUX* *TAPE* *CD* *TUNER* Main menu reappears after 2 seconds	During source switching the set is not muted	
Disrupt the mains supply to exit the Service test program			Ending the Service test by pressing the "Power" key from the Main menu will render * CD error codes to be displayed * Tuner "Program" and "Autoprogram" keys are deacti vated

Note XX - Model model (eg 56 for FW56, etc)
YY - Software verstion, counting down from 99

TRADE MODE

Operating sequence	Display shows	Remarks
At the standby mode, hold the "Program" key depressed for 2-3 seconds To exit Trade mode repeat the above procedure or activate the set with the Remote control	Commercial story	The set performs normally except the Commercial story will be displayed after 6 seconds whenever the set is placed into standby mode

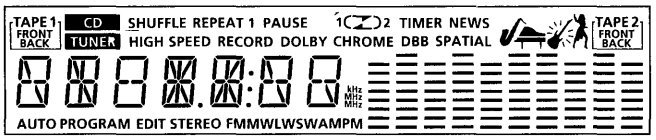
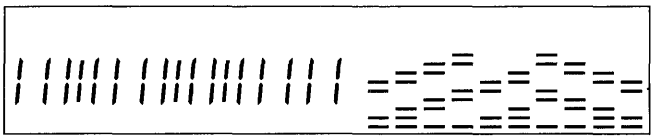
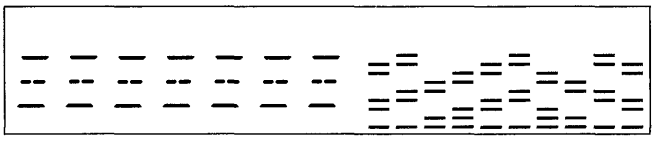
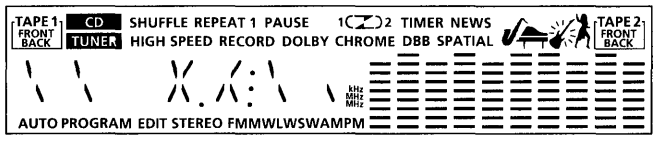
TABLE 1. SERVICE REMOTE CONTROL KEY TEST TABLE

Function/Tuner keys	Display	CD keys	Display	Tape keys	Display
Standby	19 RC	CD	09 RC	Tape 1	70 RC
Sleep	28 RC	Previous	66 RC	Tape 2	71 RC
News	15 RC	Next	65 RC	Side	75 RC
DSC	76 RC	Search -	32 RC	Rewind	74 RC
Volume -	78 RC	Pause	27 RC	F Forward	73 RC
Volume +	77 RC	Search +	31 RC	Stop	67 RC
Tuner	20 RC	Stop	59 RC	Play	72 RC
Preset Down	17 RC	Play	26 RC		
Preset Up	18 RC	Disc Up	79 RC		
Tuning Down	06 RC				
Tuning Up	02 RC				

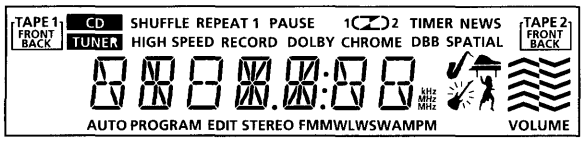
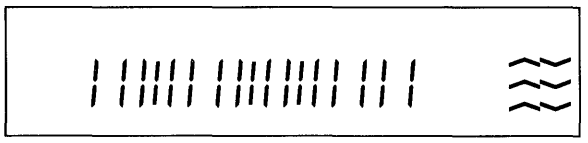
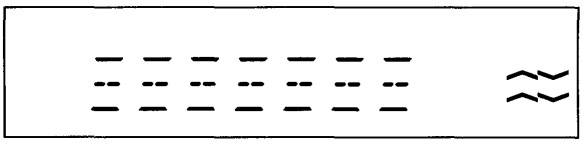
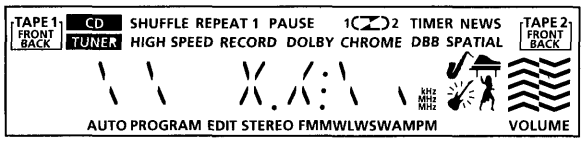
Note "RC" disappears when the key is released

Table 2. Display and Disc indicators

For all versions except /37

Steps	LCD display	Disc indicator
1		Fully on
2		Red for odd numbers Green for even numbers
3		Green for odd numbers Red for even numbers
4		Fully off

For /37 only

Steps	LCD display	Disc indicator
1		Fully on
2		Red for odd numbers Green for even numbers
3		Green for odd numbers Red for even numbers
4		Fully off

SERVICE TEST PROGRAM 2

Operating sequence	Display shows	Remarks	In case of problems check
To perform CDC test press "CD" at the Main menu screen Service level 1 is now achieved	*CDC AA*	The CDC servo version is display AA = version number	Pressing "Power" key at the Main menu screen will to exit Service test and enter into Service Play mode The set will perform as normal except in the CD mode error codes will be displayed A list of error codes are found in Table 3
Press "Next"	*SLED O*	The sledge will move outward	
Press "Prev"	*SLED I*	The sledge will move inward	
Press "Shuffle"	*PLAY*	Start the Turntable motor in the play direction	
Press "Scan"	*STOP*	Start the Turntable motor in the brake direction	
Press "Stop" will exit CDC test and return to Main menu			
Press "Play" - Service level 2	*FOC 1*	Laser is turned on and focus is achieved	Check the laser and focus circuits if the display shows *FOC 0*
Press "Stop"		Return to Service level 1	
Press "Play" - Service level 3	*DISC*	Disc motor start to turn	
Press "Stop"		Return to Service level 1	
Press "Play"	*RDL*	The Radial servo turns on and music can be heard at the Loudspeakers	
Press "Stop"		Return to Service level 1	
To perform Tuner test press "Tuner" at the Main menu screen	*ZZZ*	Tuner version is display ZZZ = Tuner version	
Use the "Preset Up" and "Preset down" to display the loaded frequencies	See Table 4	Service frequencies are now loaded into the EEROM of the µProcessor	
To end the Service test program disrupt the mains supply			Ending the Service test by pressing the "Power" key from the Main menu will render * CD error codes to be displayed * Tuner "Program" and "Autoprogram" keys are deactivated

TABLE 3. CD ERROR CODES TABLE

Error codes		Error description
E 1002	F	Focus error
E 1008	W	Out of lead-in during reading TOC
E 1010	F	Radial error
E 1011	W	Sledge error
E 1012	F	Fatal sledge error
E 1013	F	Turntable motor error
E 1042	F	Internal stack overflow
E 1050	W	Edit calculation error
E 1070	F	Centering of the tray not finished on time
E 1071	F	Tray closing not finished within time
E 1072	F	Tray has not opened within time
E 1076	W	Desired disc position could not have been reached within time
E 1077	F	Pickup Switch SW1 or SW2 did not open as expected within a certain time
E 1078	F	Pickup Switch SW1 or SW2 did not close as expected within a certain time
E 1079	W	Tray open position not reached within time
E 1080	F	Miscounting of the stocker position occured, position was correct at position 1

Note F = Fatal error and set stops operation
W = Warning and set continues operation

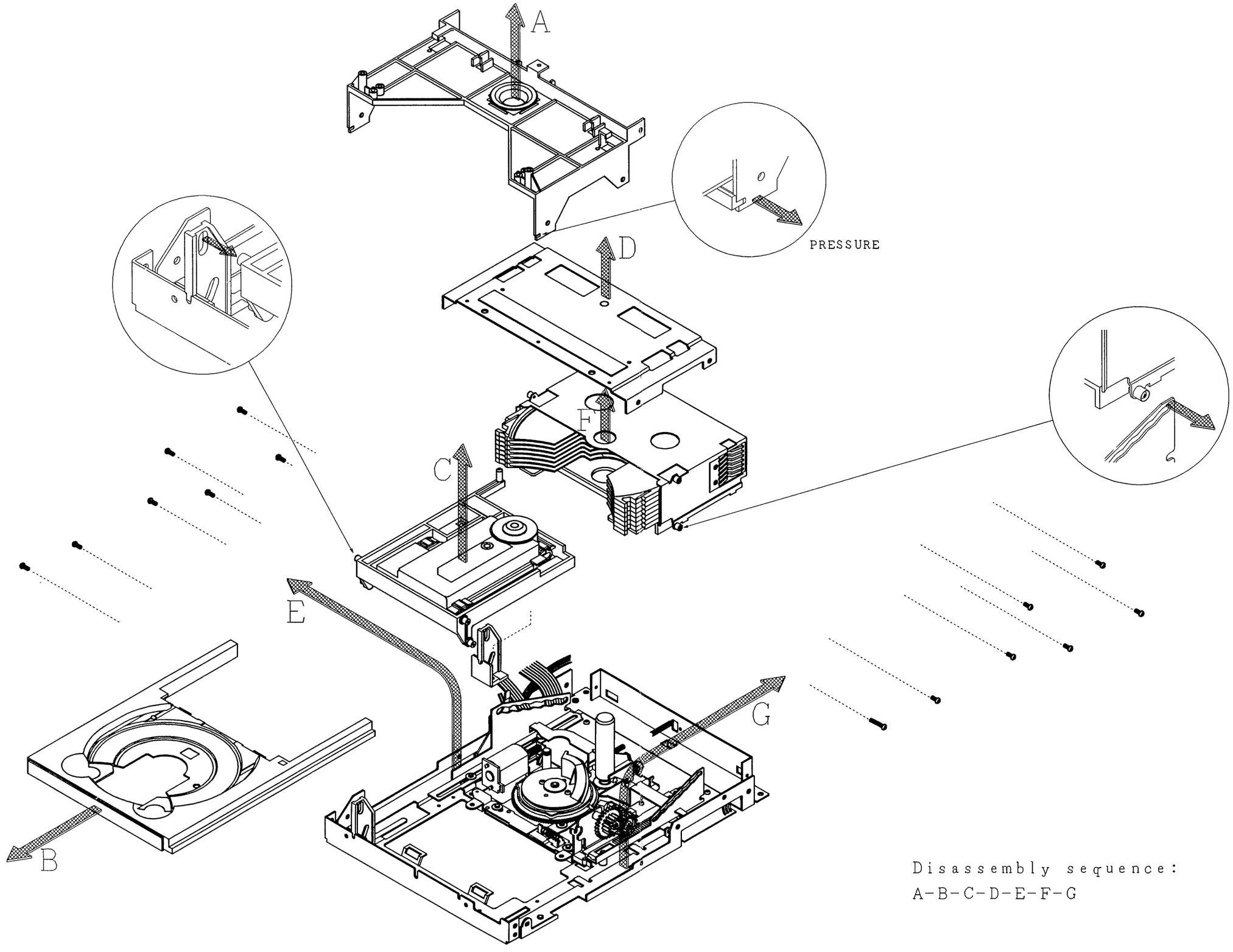
TABLE 4. TUNER SERVICE TEST FREQUENCIES

PRESET	Europe "EUR"	East Eur. "EAS"	USA "USA"	Oversea "OSC"	Japan "JAP"
1	108 00 MHz	108 00 MHz	108 00 MHz	108 00 MHz	90 00 MHz
2	87 50 MHz	65 81 MHz	87 50 MHz	87 50 MHz	76 00 MHz
3	1611 kHz	1611 kHz	1710 kHz	1710 kHz	1629 kHz
4	522 kHz	522 kHz	530 kHz	530 kHz	522 kHz
5	279 kHz	279 kHz	-	-	-
6	153 kHz	153 kHz	-	-	-
7	98 00 MHz	98 00 MHz	98 00 MHz	98 00 MHz	80 00 MHz
8	558 kHz	558 kHz	560 kHz	560 kHz	558 kHz
9	1494kHz	1494kHz	1500kHz	1500kHz	1494kHz
10	549kHz	549kHz	550kHz	550kHz	549kHz

TABLE 5. SERVICE SET KEY TEST TABLE

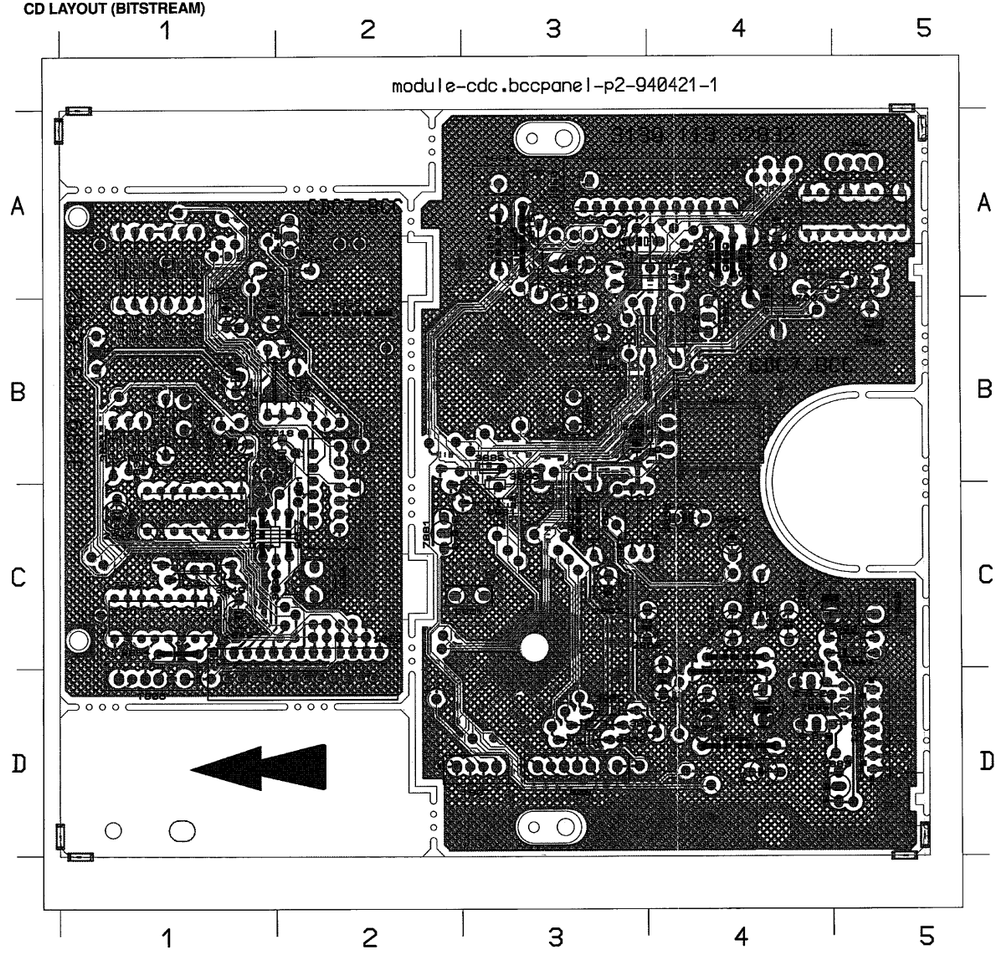
Timer/News/Tuner keys	Display	CD/Tape Keys	Display	CD Keys	Display
Timer	14	Wind A < <	34	Shuffle	61
News	15	Wind A > >	33	Scan	62
Set	16	Side A	36	Repeat	54
Band	13	Stop A	37	Prog/Review	53
Clock Set	12	Play A	35	Clear	58
Mono	11	CD Sync	38	Edit	57
Preset Down	17	Dolby B NR	40	Stop	59
Preset Up	18	Rec-Pause	39	Play-Pause	55
Prog	01	Normal Speed	43	Open-close	63
Autoprog	05	High Speed	44	Next	56
Tuning Up	02	Mode	42	Previous	60
Tuning Down	06	Play B	47	Disc 1	49
CD	09	Stop B	41	Disc 2	50
Tuner	20	Side B	48	Disc 3	51
Tape	10	Wind B < <	46	Disc 4	52
Aux-DCC	04	Wind B > >	45	Disc 5	64
Power	08			Disc 6	29
Classic	23			Disc 7	30
Pop	22				
Jazz	21				
Rock	25				
Flat	24				
Dynamic Bass Boost	03				
Spatial Sound	07				

CDC DISASSEMBLY DRAWING

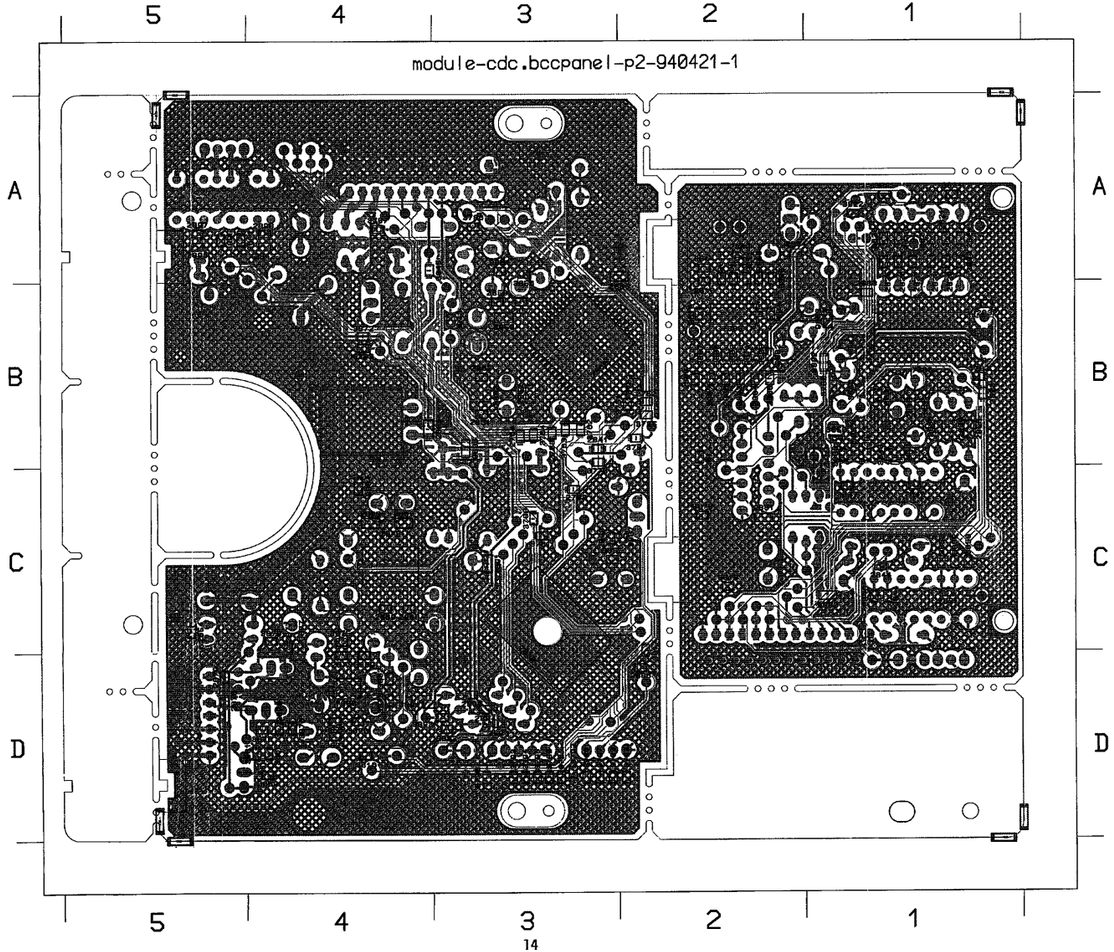


Disassembly sequence:
A-B-C-D-E-F-G

CD LAYOUT (BITSTREAM)

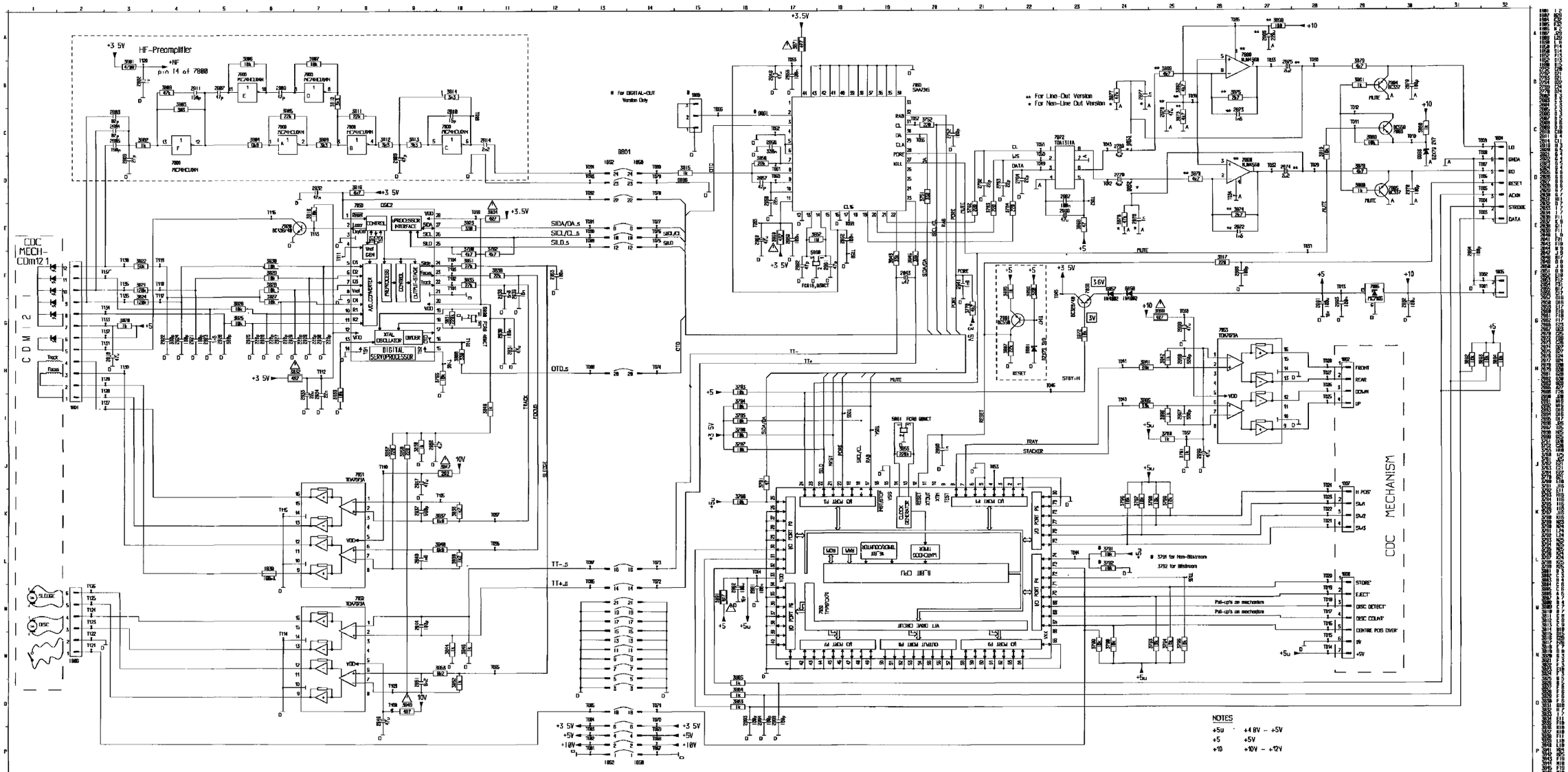


1801 C 2
1802 A 5
1804 D 5
1805 C 5
1806 D 1
1807 D 3
1808 D 3
1830 C 2
1850 A 4
1852 C 2
1880 A 3
2769 C 4
2770 D 4
2802 B 1
2818 B 2
2831 B 1
2833 B 1
2843 A 3
2847 C 1
2848 A 3
2849 C 1
2850 B 1
2856 B 3
2860 B 3
2864 C 4
2865 C 3
2866 C 4
2870 D 4
2874 D 4
2875 C 4
2881 B 3
2882 C 4
2885 D 4
2892 C 3
2898 B 5
2899 A 4
3760 A 5
3761 A 5
3801 B 2
3815 A 3
3818 A 2
3820 C 1
3825 A 1
3826 A 1
3827 A 1
3828 A 1
3829 A 1
3830 A 1
3832 B 2
3834 B 1
3835 B 1
3838 B 1
3847 C 1
3848 B 1
3849 C 1
3851 B 1
3860 A 4
3863 D 3
3864 D 3
3865 D 3
3867 C 3
3868 C 3
3871 A 4
3885 B 3
3886 C 3
3890 C 5
3891 C 3
3898 C 4
3899 A 4
5800 B 3
5801 C 3
5890 B 1
6857 B 4
6858 B 3
6881 C 3
6883 C 5
7820 A 2
7851 C 1
7852 C 1
7853 A 5
7856 B 4
7881 C 2
7883 D 5
7884 D 4
7885 D 4
7886 B 4
9852 D 4
9853 C 4
9854 C 1
9855 C 1
9856 B 2
9857 C 2
9858 A 4
9859 A 4
9860 A 4
9861 A 3
9862 C 3
9863 D 4
9866 A 3



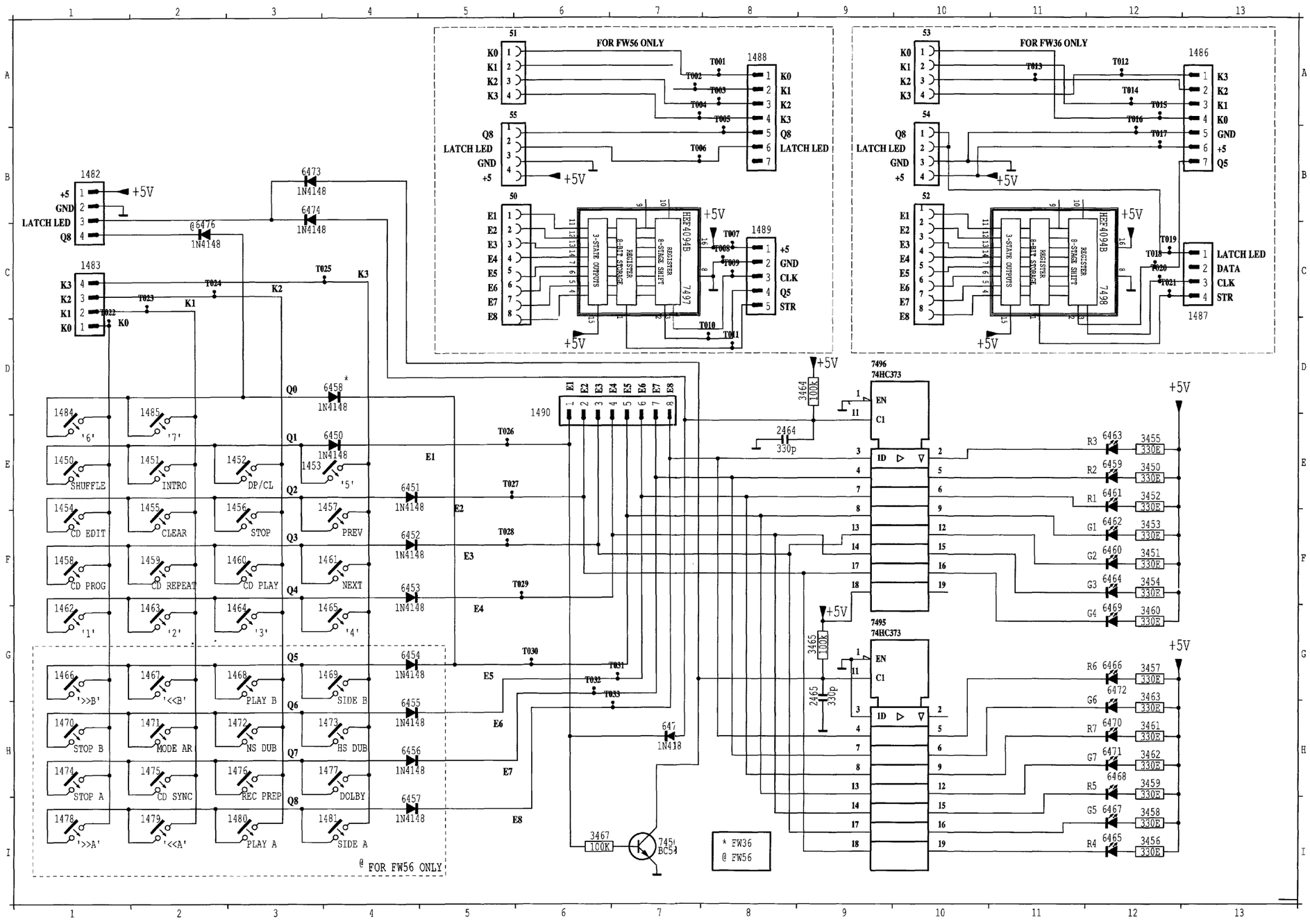
2752 B2
2762 C3
2763 B3
2764 B3
2803 B2
2804 B2
2805 B2
2806 B2
2807 B2
2808 B2
2809 A2
2810 B2
2811 B2
2814 B2
2820 A1
2821 A1
2822 A1
2823 A1
2824 A1
2825 A1
2826 A1
2827 A1
2828 A1
2829 A1
2830 A1
2832 B1
2834 A2
2836 B1
2837 C1
2838 B1
2839 B1
2840 C1
2841 B3
2844 C1
2851 C1
2852 B3
2853 B1
2854 C5
2855 A2
2857 B3
2858 B3
2859 B3
2861 B3
2862 B3
2863 C4
2867 C4
2868 C4
2869 C4
2872 D4
2876 D4
2877 C4
2878 D5
2879 D5
2883 B4
2885 D2
2890 C3
2891 C3
2893 D3
2894 D3
2895 D3
2897 A5
2898 A4
3751 B2
3752 B2
3755 B1
3762 B3
3763 B3
3764 B3
3770 B3
3780 B1
3781 C3
3782 B1
3783 B4
3784 B2
3785 B2
3786 A3
3787 A4
3788 C3
3789 D3
3790 D3
3791 D3
3793 D3
3794 D3
3795 D3
3796 D3
3797 D3
3798 D3
3799 D2
3802 B2
3803 B2
3804 B2
3805 A3
3806 B2
3807 B2
3808 B2
3809 A2
3810 B2
3811 A2
3812 A2
3813 A2
3814 A2
3816 D4
3817 C2
3819 B1
3821 A1
3822 A1
3823 B1
3824 A1
3831 B1
3833 B1
3836 B1
3837 B1
3839 B1
3840 B1
3841 A5
3842 A4
3843 B3
3844 C1
3845 A4
3846 C1
3850 B1
3852 C1
3853 C1
3855 C3
3856 A3
3857 B1
3858 C1
3861 A3
3862 B3
3866 B1
3872 B4
3876 D4
3877 C4
3878 D4
3879 C4
3880 D4
3881 D4
3887 C2
3889 D4
3892 D3
3893 D3
3894 D4
3895 A5
3896 A5
7830 C3
7850 B1
7860 B3
7870 C4
7880 D4
9870 C2
9880 C1
9881 C2
9882 B1
9883 B1
9884 C4
9885 B3

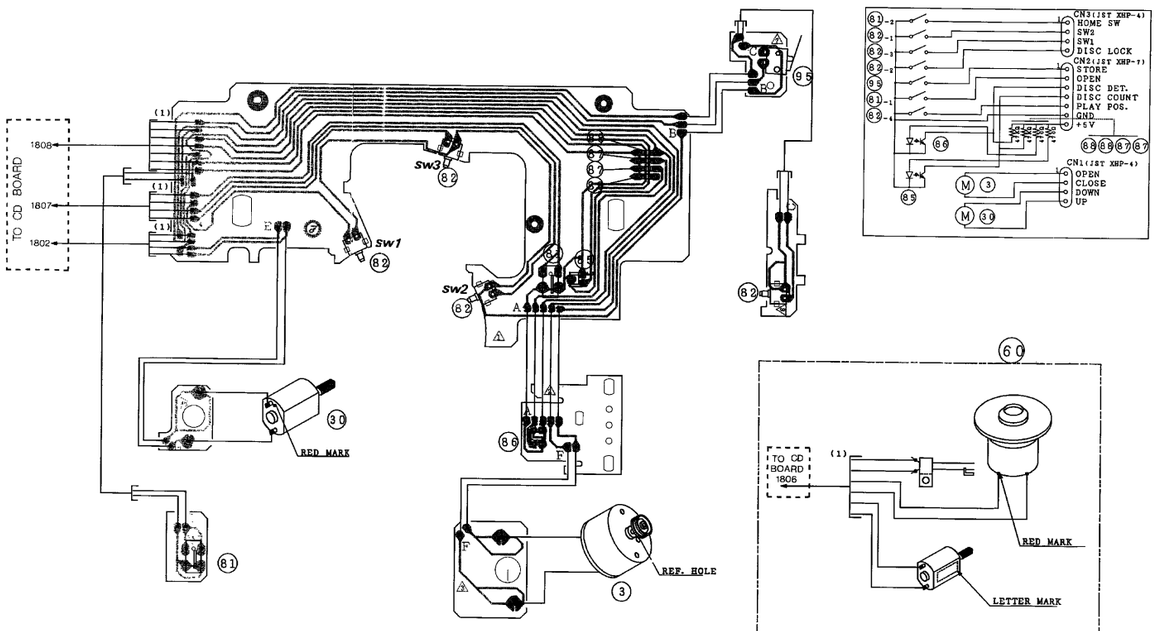
CD CIRCUIT (NON-BITSTREAM)



CDC KEY CIRCUIT

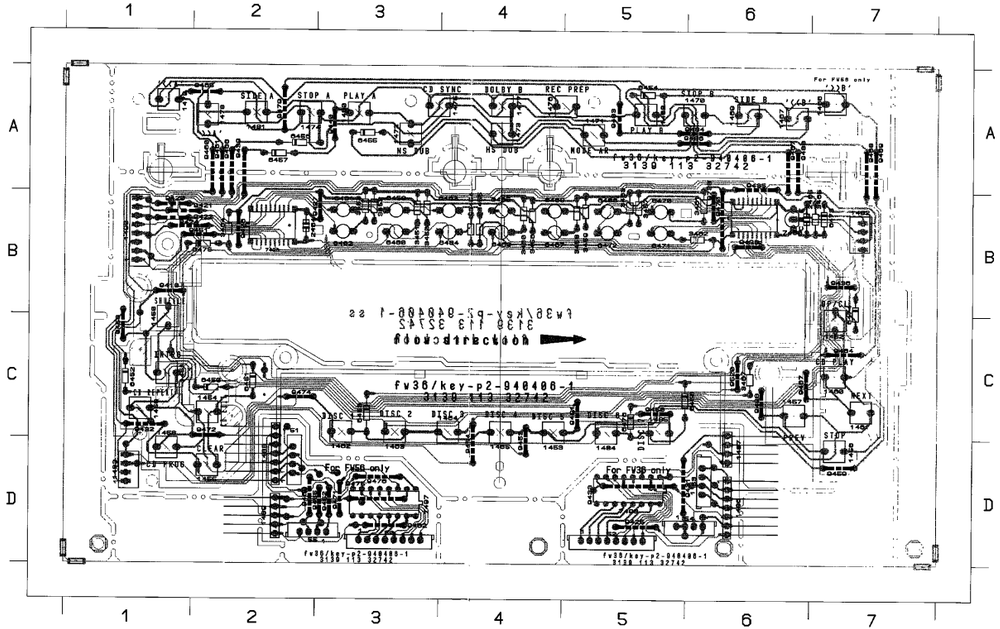
ANOTAÇÕES :





NOTE: NUMBERS IN CIRCLES REFERS TO POSITION NUMBERS IN THE CDC EXPLODED VIEW.

fw36/key-p2-940406-1 spcs
3139 113 32742



CONNECTIONS AND CONTROLS

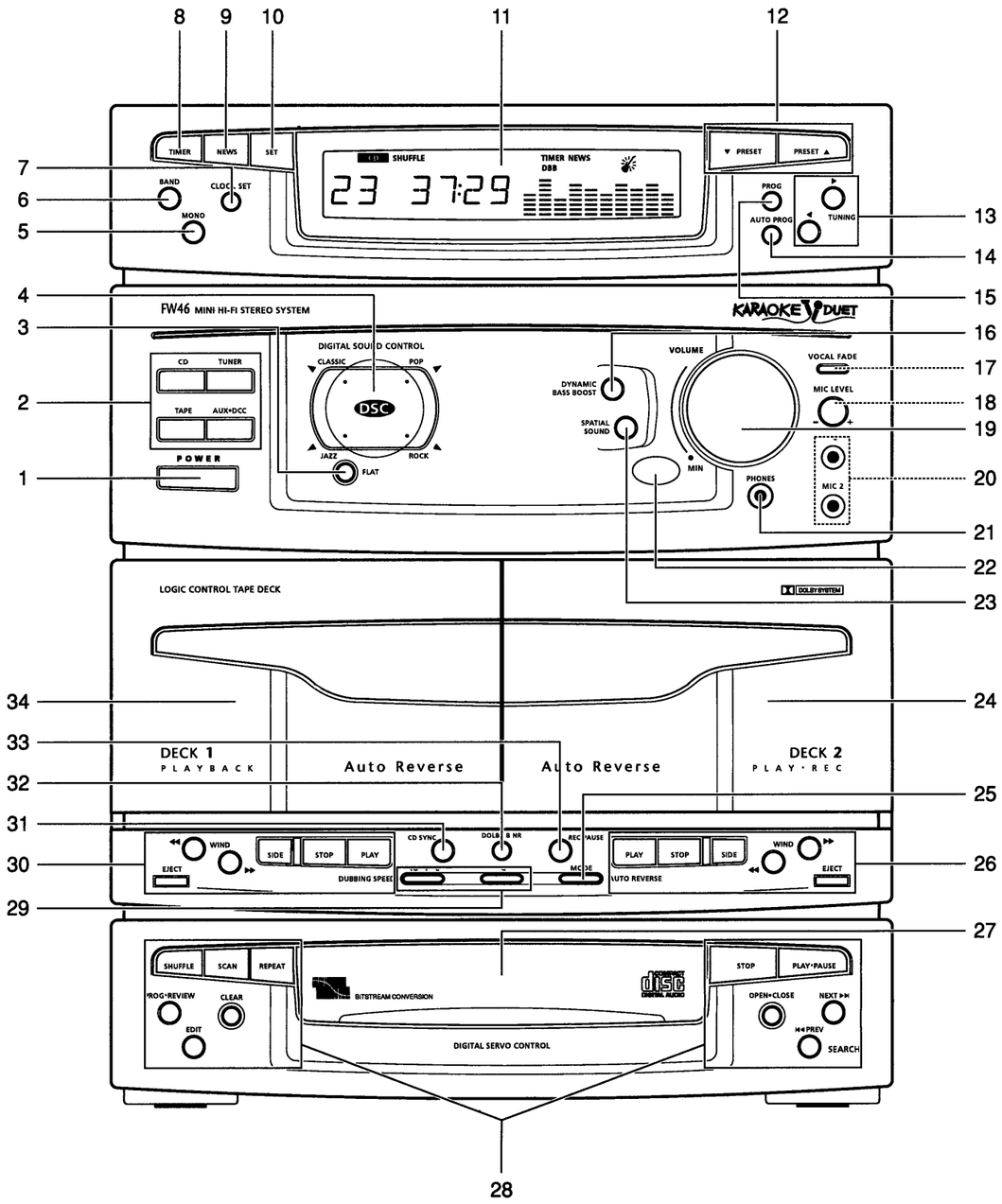


Figure 1

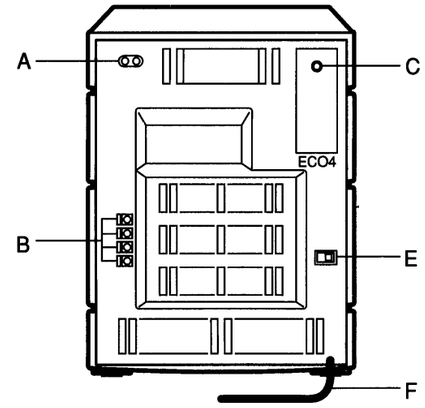


Figure 2

CONNECTIONS AND CONTROLS

1	Power		1414			Wind <<	1467
2	Function controls	CD	1421			Wind >>	1466
		Tuner	1426			Eject	
		Tape	1420	27	CD Tray		
		Aux-DCC	1410	28	CD controls	Shuffle	1450
3	Flat		1430			Scan	1451
4	Digital Sound Control	Classic	1431			Repeat	1459
		Pop	1432			Program/Review	1458
		Jazz	1433			Edit	1454
		Rock	1434			Clear	1455
5	Mono		1419			Stop	1456
6	Band		1425			Play/Pause	1460
7	Clock set		1418			Open/Close	1452
8	Timer		1424			Next	1461
9	News		1423			Previous	1457
10	Set		1422	29	Dubbing speed	Normal	1472
11	LCD display		1401			High	1473
12	Preset up/down		1429, 1428	30	Play Deck controls	Eject	
13	Tuning up/down		1412, 1416			Wind <<	1479
14	Auto program		1417			Wind >>	1478
15	Program		1413			Side	1481
16	Dynamic bass boost		1411			Stop	1474
17 *	Vocal fade		1553			Play	1480
18 *	Mic level		3673	31	CD Sync		1475
19	Volume		3629	32	Dolby B NR		1477
20 *	Mic inputs		1551, 1562	33	Record/Pause		1476
21	Headphone socket		1550	34	Cassette compartment 1		
22	IR sensor		6406	A	Aux-TV input		1552
23	Spatial Sound		1415	B	Loudspeaker sockets		1304
24	Cassette compartment 2			C	FM antenna socket		1101 or 1110
25	Mode		1471	D	AM antenna socket		1111
26	Rec/Pb Deck controls	Play	1468	E	Voltage selector		1281
		Stop	1470	F	Mains cord		
		Side	1469				

* For Karaoke version only

SERVICE TEST PROGRAM 1

Operating sequence	Display shows	Remarks	In case of problems check
Hold "Program" and "Preset Up" button down while Power on to enter Service test program.	*XX YY-S #* This is the main menu.	where: XX - Type no. numeric YY - Master µP version S - Service mode	
Press "Program"	*P* Main menu reappears after 2 seconds.	Eeprom test	Check IC if Display shows *ERR* or *N*
Press "Autoprogram"	*N* Main menu reappears after 2 seconds.	Eeprom is now reset to default data.	
Press "Clock Set" Press "Clock Set" Press "Clock Set"	*32* *8* Main menu reappear.	The Alarm buzzer is turned on. An output signal of 4096Hz is available at pin 37 of µProcessor. The output signal at pin 37 is now 3906.25Hz.	Check X'tal Check 8MHz oscillator
Press "Set Timer/News"	*F* *N* Main menu reappears after 2 seconds.	Pressing "Set Timer/News" key will alternate between Fast and Normal speed. In the Fast mode the clock increases at 1 minute per second. Leaving the test program now will allow quick customer checks on the clock/timer/alarm function.	Ensure the clock is in normal speed before returning to customer.
Press "Mono" and followed by any key on the set or Remote control. Press "Mono" to return to Main menu	See key test Table 1 and 2.		
Press "Tuning Up" Press"Tuning Down"	*U* *D*	Volume turns clockwise slowly until maximum. Volume turns anti-clockwise until minimum.	
Press "News"	Figure 3-6 and Main menu.	Pressing the "News" key will scroll through the 4 different displays and the Main menu.	

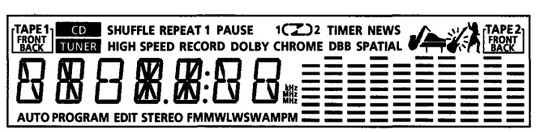


Figure 3

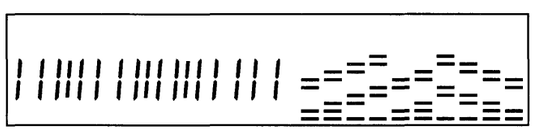


Figure 4

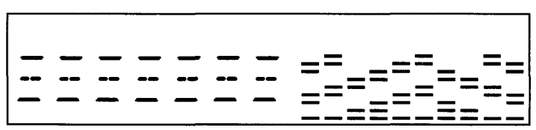


Figure 5

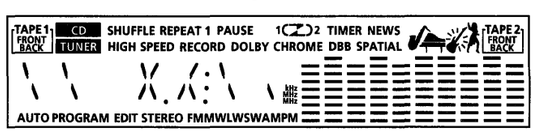


Figure 6

Press "Timer"	*AUX* TAPE *CD* *TUNER* Main menu reappears after 2 seconds.	During source switching the set is not muted.	
Disrupt the mains supply to exit the Service test program.			Ending the Service test by pressing the "Power" key will render: * CD error codes to be displayed. * Tuner "Program" and "Autoprogram" keys non functioning.

Note: XX - Model model (eg 46 for FW46, etc.)
YY - Software verstion, counting down from 99

SERVICE TEST PROGRAM 2

Operating sequence	Display shows	Remarks	In case of problems check
To perform CD test press "CD" at the Main menu screen. Press "Stop" - Service pos 0	*CD AA* *S*	The CD servo version is display. AA = version number During this test the sledge will move outward.	Press "Power" key at the Main menu screen to exit Service test. Enter CD mode and the set perform as normal except error codes will be displayed A list of error codes are found in Table 4.
Press "Next" - Service pos 1	*F*	Focus is switched on.	
Press "Next" - Service pos 2	*D*	Disc motor is switched on.	
Press "Next" - Service pos 3 Pressing "Previous" will bring the set to the previous service pos.	*R*	Radial is switched on.	
To perform Tuner test press "Tuner" at the Main menu screen. Use the "Preset Up" and "Preset down" to display the loaded frequencies.	*ZZZ* See Table 3.	Tuner version is display. ZZZ = Tuner version Service frequencies are now loaded into the EEROM of the µProcessor.	
To end the Service test program disrupt the mains supply.			Ending the Service test by pressing the "Power" key will render: * CD error codes to be displayed. * Tuner "Program" and "Autoprogram" keys non functioning

TABLE 1. SERVICE KEY TEST TABLE

Timer/News/Tuner/ Function keys	Display	CD/Tape Keys	Display	CD keys	Display
Timer	14	Wind A <<	34	Shuffle	61
News	15	Wind A >>	33	Scan	62
Set	16	Side A	36	Repeat	54
Band	13	Stop A	37	Prog-Review	53
Clock Set	12	Play A	35	Clear	58
Mono	11	CD Sync	38	Edit	57
Preset Down	17	Dolby B NR	40	Stop	59
Preset Up	18	Rec-Pause	39	Play-Pause	55
Prog	01	Normal Speed	43	Open-Close	63
Autoprog	05	High Spead	44	Next	56
Tuning Up	02	Mode	42	Previous	60
Tuning Down	06	Play B	47		
CD	09	Stop B	41		
Tuner	20	Side B	48		
Tape	10	Wind B <<	46		
Aux-DCC	04	Wind B >>	45		
Power	08				
Classic	23				
Pop	22				
Jazz	21				
Rock	25				
Flat	24				
Dynamic Bass Boost	03				
Spatial Sound	07				

TABLE 2. SERVICE REMOTE CONTROL KEY TEST TABLE

Function/Tuner keys	Display	CD keys	Display	Tape keys	Display
Standby		CD	09	Tape 1	50
Sleep	28	Previous	30	Tape 2	51
News	15	Next	29	Side	67
DSC	68	Search -	32	Rewind	66
Volume -	70	Pause	27	F. Forward	65
Volume +	69	Search +	31	Stop	64
Tuner	20	Stop	59	Play	52
Preset Down	17	Play	26		
Preset Up	18				
Tuning Down	06				
Tuning Up	02				

TABLE 3. TUNER SERVICE TEST FREQUENCIES

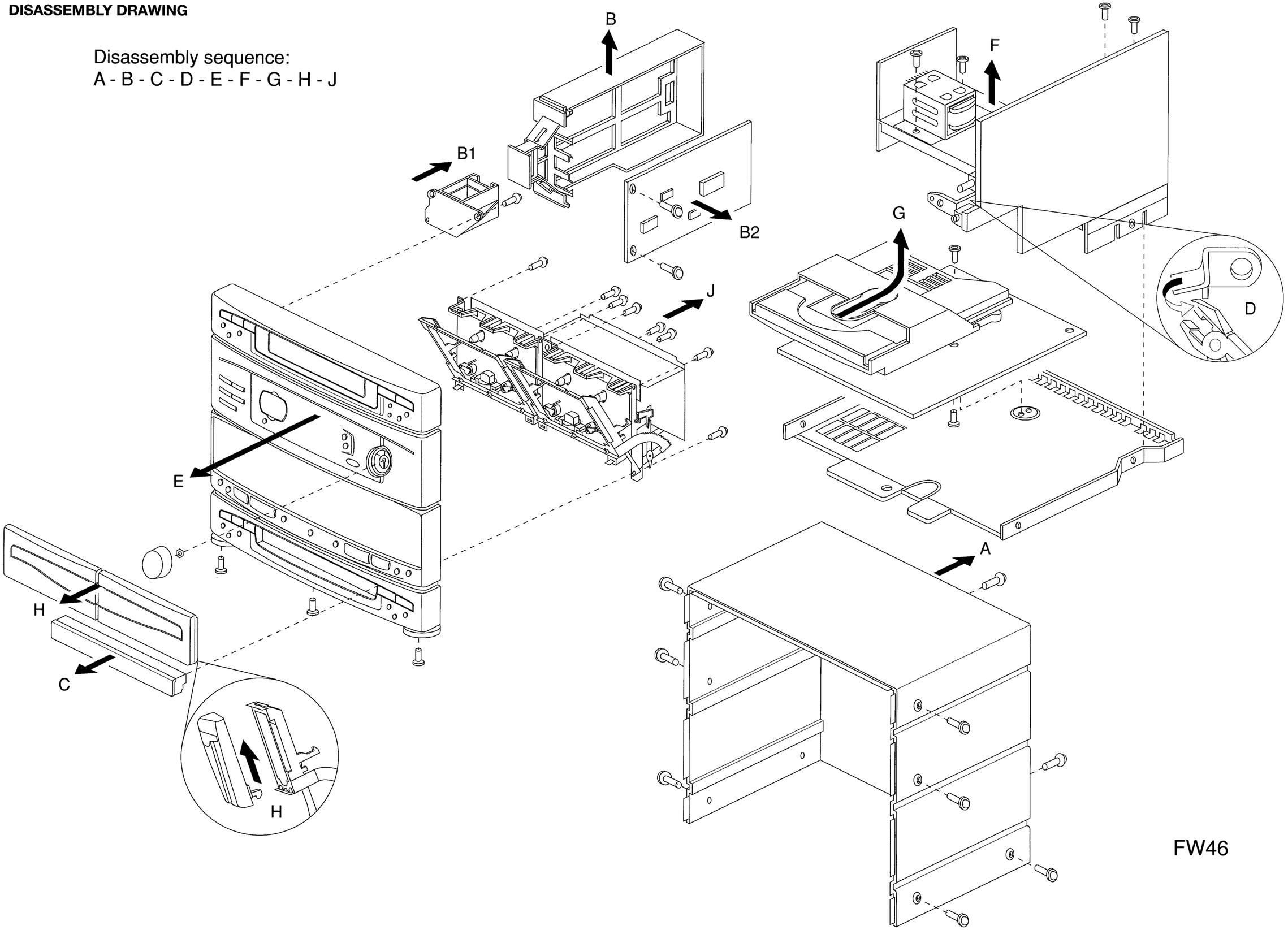
PRESET	Europe "EUR"	East Eur. "EAS"	USA "USA"	Oversea "OSC"	Japan "JAP"
1	108.00 MHz	108.00 MHz	108.00 MHz	108.00 MHz	90.00 MHz
2	87.50 MHz	65.81 MHz	87.50 MHz	87.50 MHz	76.00 MHz
3	1611 kHz	1611 kHz	1710 kHz	1710 kHz	1629 kHz
4	522 kHz	522 kHz	530 kHz	530 kHz	522 kHz
5	279 kHz	279 kHz	-	-	-
6	153 kHz	153 kHz	-	-	-
7	98.00 MHz	98.00 MHz	98.00 MHz	98.00 MHz	80.00 MHz
8	558 kHz	558 kHz	560 kHz	560 kHz	558 kHz
9	1494kHz	1494kHz	1500kHz	1500kHz	1494kHz
10	549kHz	549kHz	550kHz	550kHz	549kHz

TABLE 4. CD ERROR CODES TABLE

Error codes	Check area	Remarks
E 1002	ICs 7000, 7060 and 7080	Focus error, no disc
E 1007	CDM 12 and Disc	Subcode error, no valid subcode
E 1008	Bad Disc and Lens	TOC error, out of lead-in area while reading TOC
E 1009	IC 7101 and 7102	CD4 + decoder error
E 1010	IC 7000 and 7080	Radial error
E 1012	ICs 7000 and 7660	Fatal sledge error
E 1013	ICs 7102, 7140, 7141 and 7660	Turntable motor error
E 1030	CDM 12 and IC 7000	Too many grooves to jump
E 1031	CDM 12 and IC 7000	Search error
E 1032	CDM 12 and IC 7000	Search binary error
E 1033	CDM 12 and IC 7000	Search index error
E 1034	CDM 12 and IC 7000	Search time error
E 1037	CDM 12 and IC 7000	Selection error
E 1050	Operating error	Edit calculation error
E 1051	Operating error	Edit track count error
E 1052	Operating error	Edit optimal error

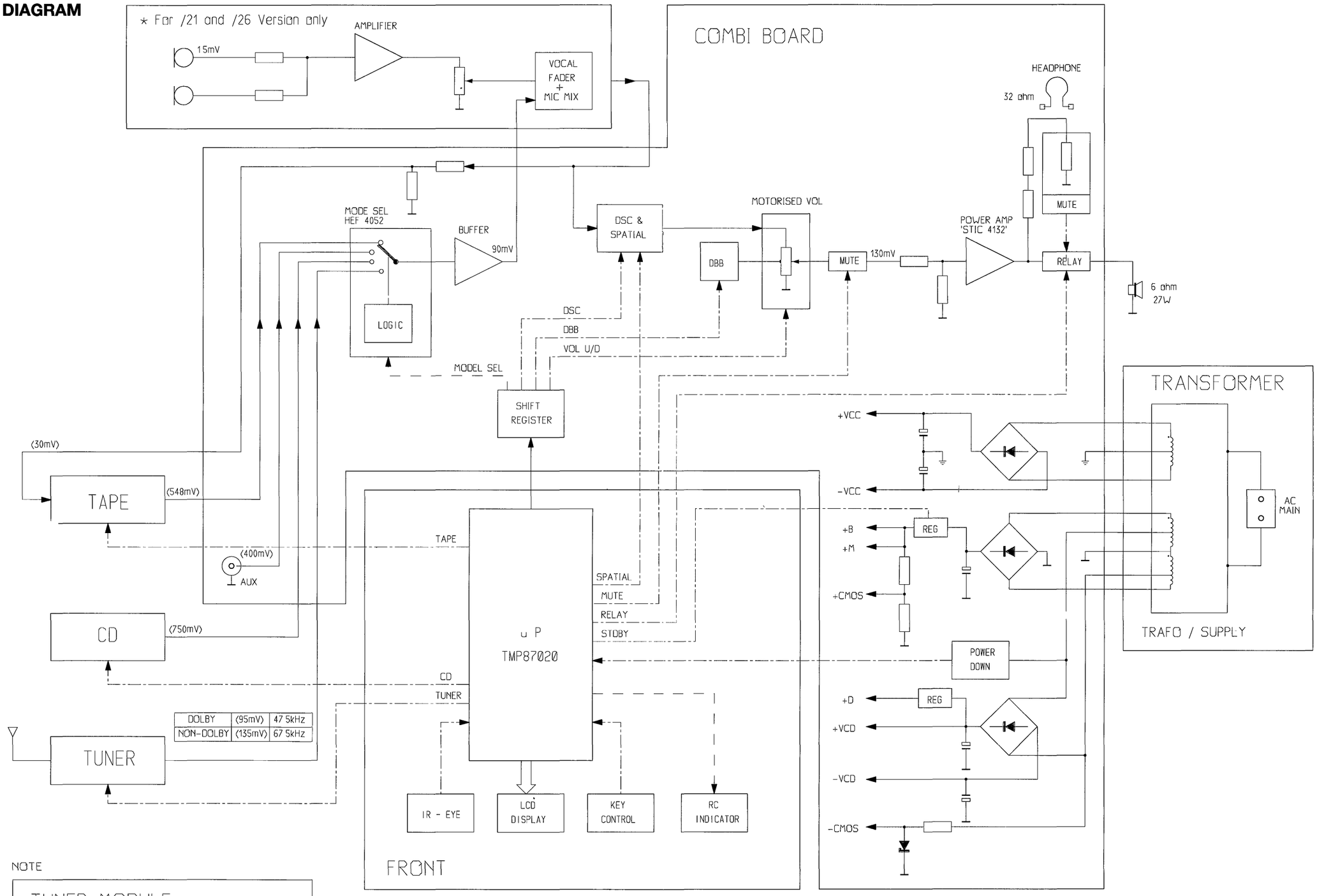
DISASSEMBLY DRAWING

Disassembly sequence:
A - B - C - D - E - F - G - H - J



FW46

BLOCK DIAGRAM



NOTE

TUNER MODULE

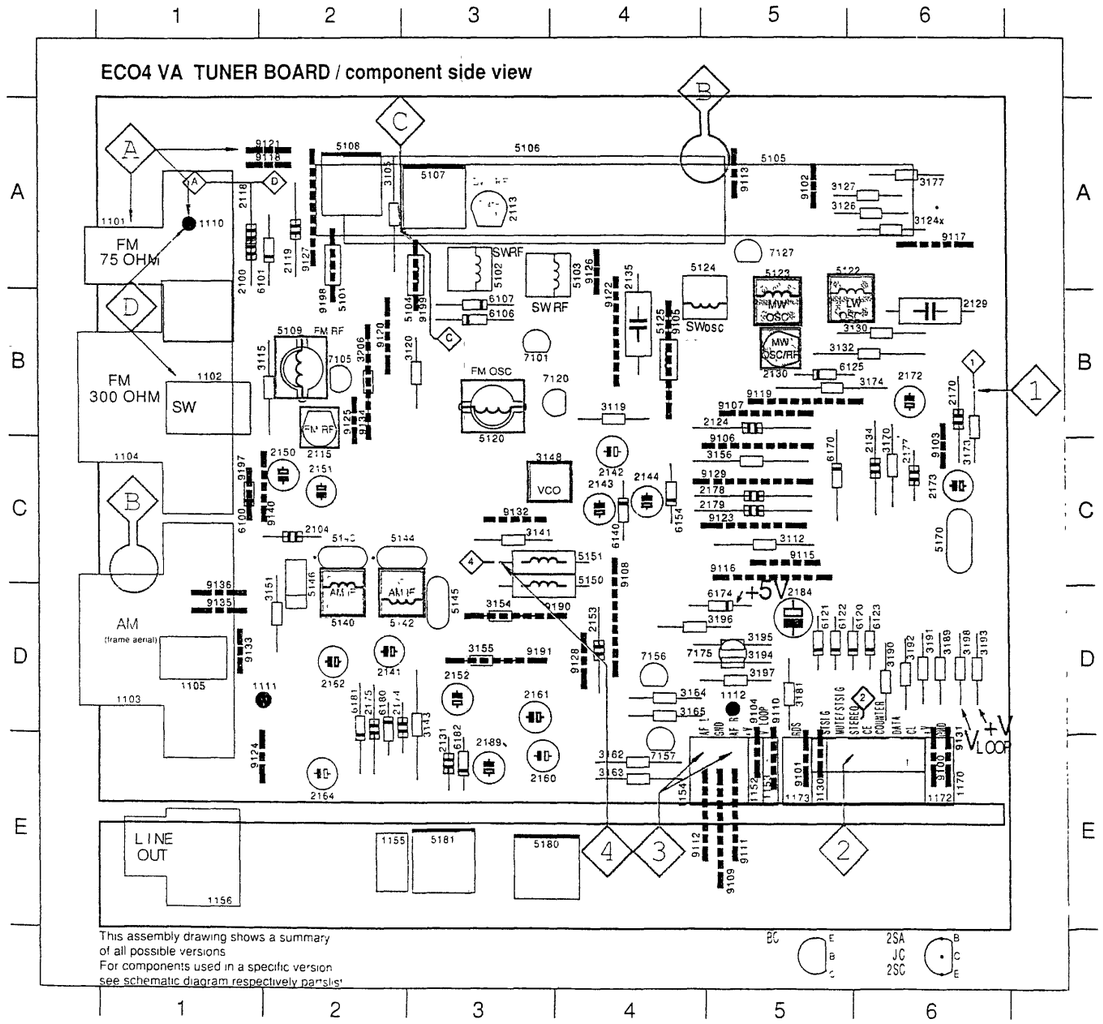
ECO4 for all Version except
For /22, use TUNER 92 with FTZ Version and
For /26, use TUNER 92 JAPAN Version

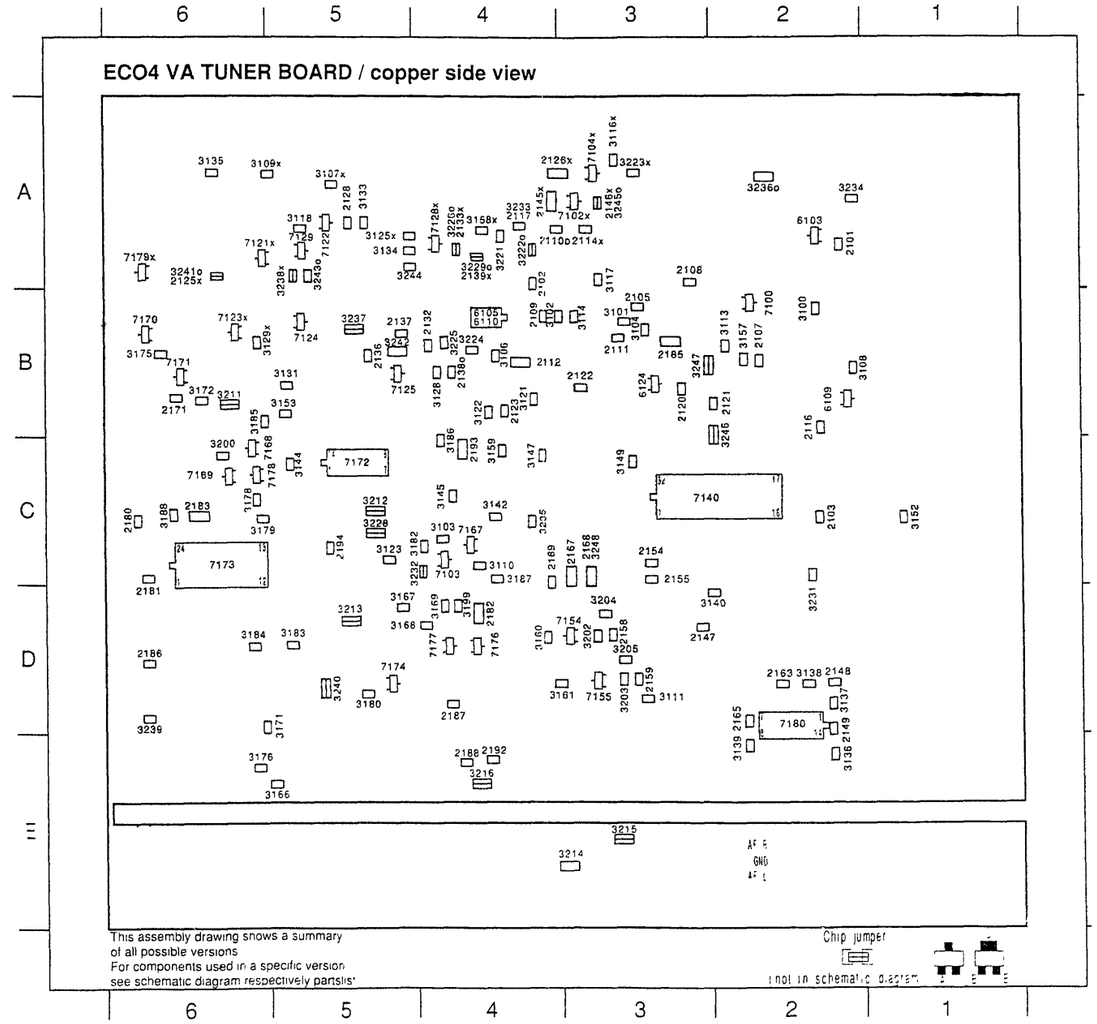
EC04VA LAYOUT (Not For /22)

FW56

1101 A 1	1156 E 1	2100 A 1	2135 B 4	2164 E 2	2191 A 6	3143 D 3	3174 B 5	3198 D 6	5122 B 6	5170 C 6	6140 C 4	7157 E 4	9110 E 5	9123 C 5	9135 D 1				
1102 B 1	1170 E 6	2104 C 2	2141 D 2	2170 B 6	3105 A 2	3148 C 3	3177 A 6	3206 B 2	5123 B 5	5180 E 3	6154 C 4	7175 D 5	9111 E 5	9124 E 1	9136 D 1				
1103 D 1	1172 E 6	2106 B 4	2142 C 4	2172 B 6	3112 C 5	3151 D 2	3181 D 5	5101 A 2	5124 B 5	5181 E 3	6170 C 5	9100 E 6	9112 E 4	9125 B 2	9140 C 2				
1104 B 1	1173 E 5	2113 A 3	2143 C 4	2173 C 6	3115 B 2	3154 D 3	3189 D 6	5102 A 3	5125 B 4	6100 C 1	6174 D 5	9101 E 5	9113 A 5	9126 A 4	9190 D 3				
1105 D 1		2115 B 2	2144 C 4	2174 D 2	3119 B 4	3155 D 3	3190 D 6	5103 A 3	5140 D 2	6101 A 2	6180 D 2	9102 A 5	9115 C 5	9127 A 2	9191 D 3				
1110 A 1		2118 A 1	2150 C 2	2175 D 2	3120 B 3	3156 C 5	3191 D 6	5104 A 3	5142 D 2	6106 B 3	6181 D 2	9103 C 6	9116 C 5	9128 D 4	9197 C 1				
1111 D 2		2119 A 2	2151 C 2	2177 C 6	3124 A 6	3162 E 4	3192 D 6	5105 A 4	5143 C 2	6107 B 3	6182 E 3	9104 E 5	9117 A 6	9129 C 5	9198 A 2				
1112 D 5		2124 B 5	2152 D 3	2178 C 5	3126 A 6	3163 E 4	3193 D 6	5106 A 4	5144 C 2	6120 D 6	7101 B 3	9105 B 4	9118 A 2	9130 E 5	9199 A 3				
1152 E 5		2129 B 6	2153 D 4	2179 C 5	3127 A 6	3164 D 4	3194 D 5	5107 A 3	5145 D 3	6121 D 5	7105 B 2	9106 C 5	9119 B 5	9131 E 6					
1153 E 5		2130 B 5	2160 E 3	2184 D 5	3130 B 6	3165 D 4	3195 D 5	5108 A 2	5146 D 2	6122 D 5	7120 B 4	9107 B 5	9120 B 2	9132 C 3					
1154 E 4		2131 E 3	2161 D 3	2189 E 3	3132 B 6	3170 C 6	3196 D 4	5109 B 2	5150 D 3	6123 D 6	7127 A 5	9108 D 4	9121 A 2	9133 D 1					
1155 E 2		2134 C 6	2162 D 2	2190 A 2	3141 C 3	3173 B 6	3197 D 5	5120 B 3	5151 C 3	6125 B 5	7156 D 4	9109 E 5	9122 B 4	9134 B 2					

o for AM versior only
x for LW-versior only
y for USA version only
z not for all vers ons




ECO4 VA TUNER BOARD / copper side view
This assembly drawing shows a summary of all possible versions
For components used in a specific version see schematic diagram respectively partslist
Chip jumper

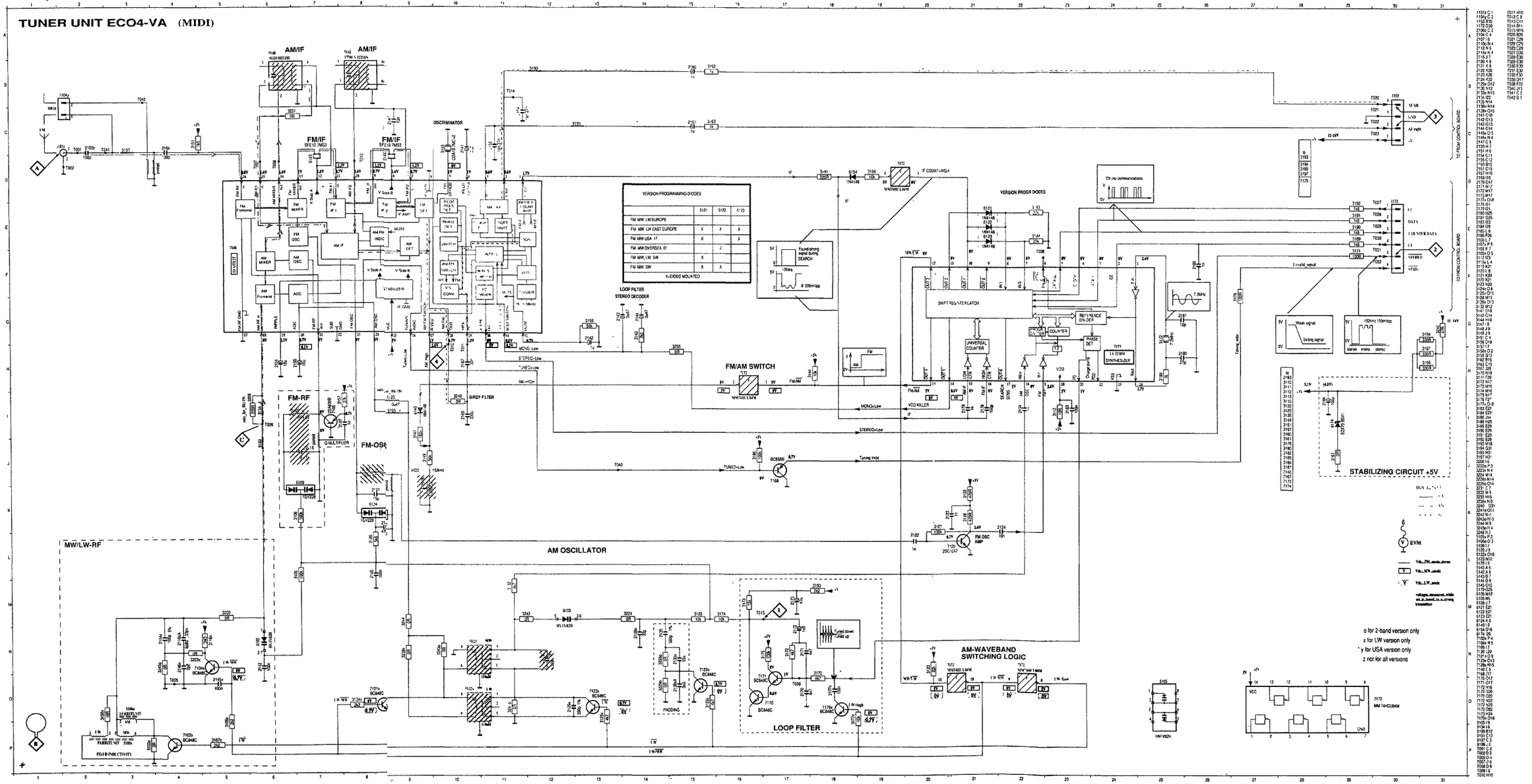
TUNER Adjustment table (ECO4 VA FM/MW- and FM/MW/LW - versions with AM-ferrite antenna)

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT * 1)						
FM 87.5 - 108MHz			108 MHz	5120		8V ± 0 2V
			87 5MHz	check		4.1V ± 0.5V
FM /14 East Europe 65.81 - 108MHz			108 MHz	5120		8V ± 0.2V
			65 81 MHz	check		0 8V ± 0 4V
MW 2-band version, 10kHz grid 530 - 1710kHz			1710kHz	5123	1	9V±0 1V (7 2±1 2V) 1)
			530kHz	check		1V±0 4V (1 1±0.5V) 1)
LW 153 - 279kHz			279kHz	5122		8V±0 2V (7 5±1 5V) 1)
			153kHz	check		1V±0 4V (1 1±0.5V) 1)
MW 3-band version 522 - 1611kHz			1611kHz	5123		8V±0 1V (7 2±1 2V) 1)
			522kHz	check		1V±0.4V (1.1±0 5V) 1)
FM - RF						
FM	108MHz	A mod=1kHz Δf=22 5kHz	108MHz	2115	3	MAX ↕
	87 5MHz		87 5MHz	5109		
FM /14 East Europe	108MHz		108MHz	2115		
	65.81MHz		65 81MHz	5109		
VCO						
FM	98 MHz, 1mV continuous wave	A	98MHz	3148	2	152kHz ± 1kHz
AM - IF						
MW	540kHz Δf = 10kHz as low as possible	100nF 50E C	540kHz	5142 5140	4	symmetrical and max height
AM - RF						
LW	198kHz	B mod=1kHz 30% AM	198kHz	5122	4	MAX
MW 3-band version	1494kHz		1494kHz	2130		MAX ↕
	549kHz		549kHz	5123		
MW 2-band version, 10kHz grid	1500kHz		1500kHz	2130		
	550kHz		550kHz	5123		

* Use Service Test Program. By selecting the TUNER TEST, test frequencies will be stored as preset frequ automatically. Adjustment of AM-RF stage influences the varicap voltage. Therefore check if varicap voltage fulfils value stated within brackets after AM-RF adjustment.

↕ repeat

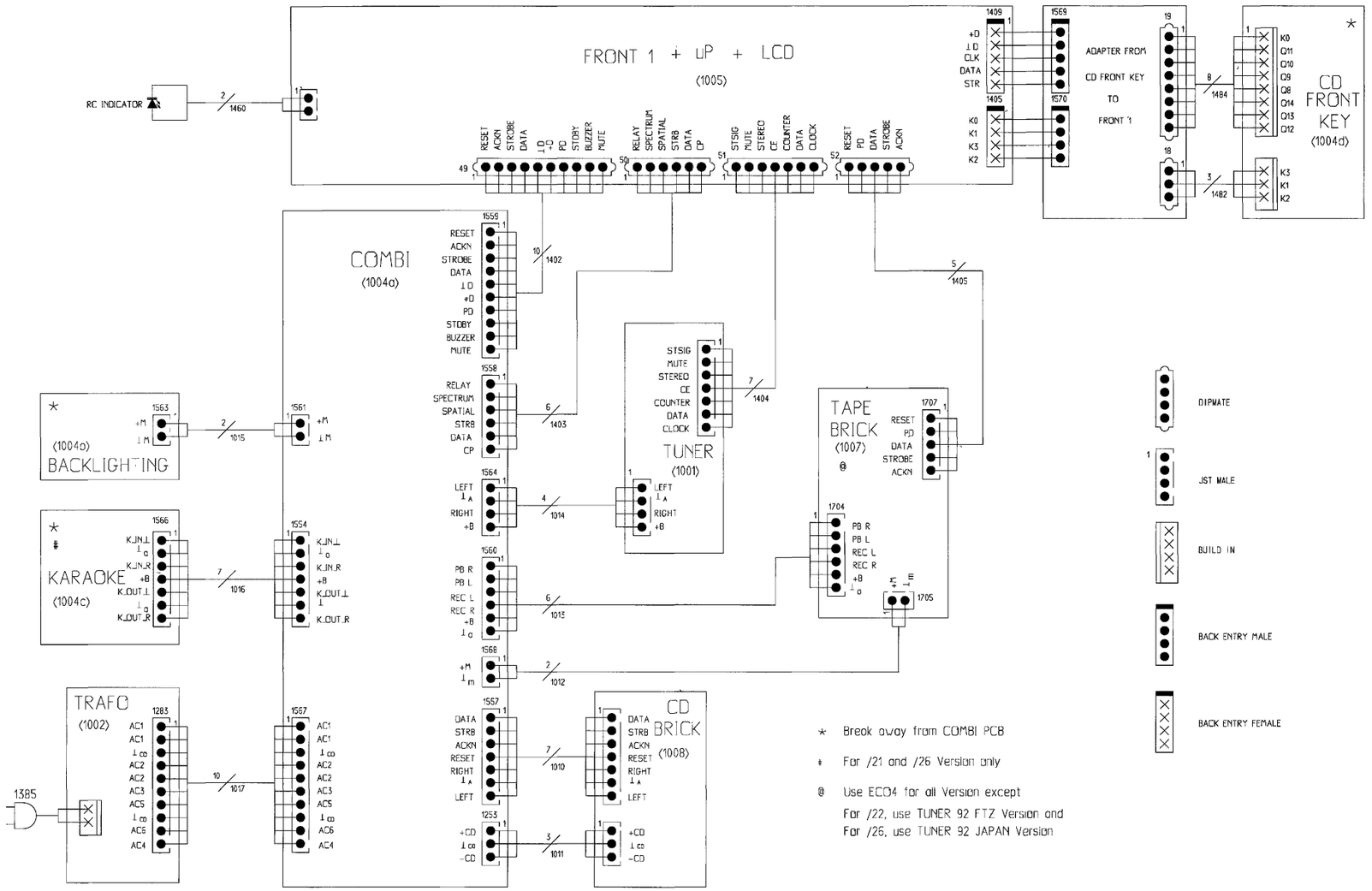
EC04VA CIRCUIT (Not For /22)



PCS 64 073

35 36 37

WIRING DIAGRAM



(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance
Keep components and tools also at this potential

ESD

(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenuber elektrostatischen Entladungen (ESD)
Unsorgfaltige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerates
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

(GB)
Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

(NL)
Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

(I)
Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

(F)
Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utilisées les pièces de rechange identiques à celles spécifiées

(D)
Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verandert werden; für Reparaturen sind Original-Ersatzteile zu verwenden

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA."

"Pour votre sécunté, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre'appareil en panne"

CLASS 1
LASER PRODUCT

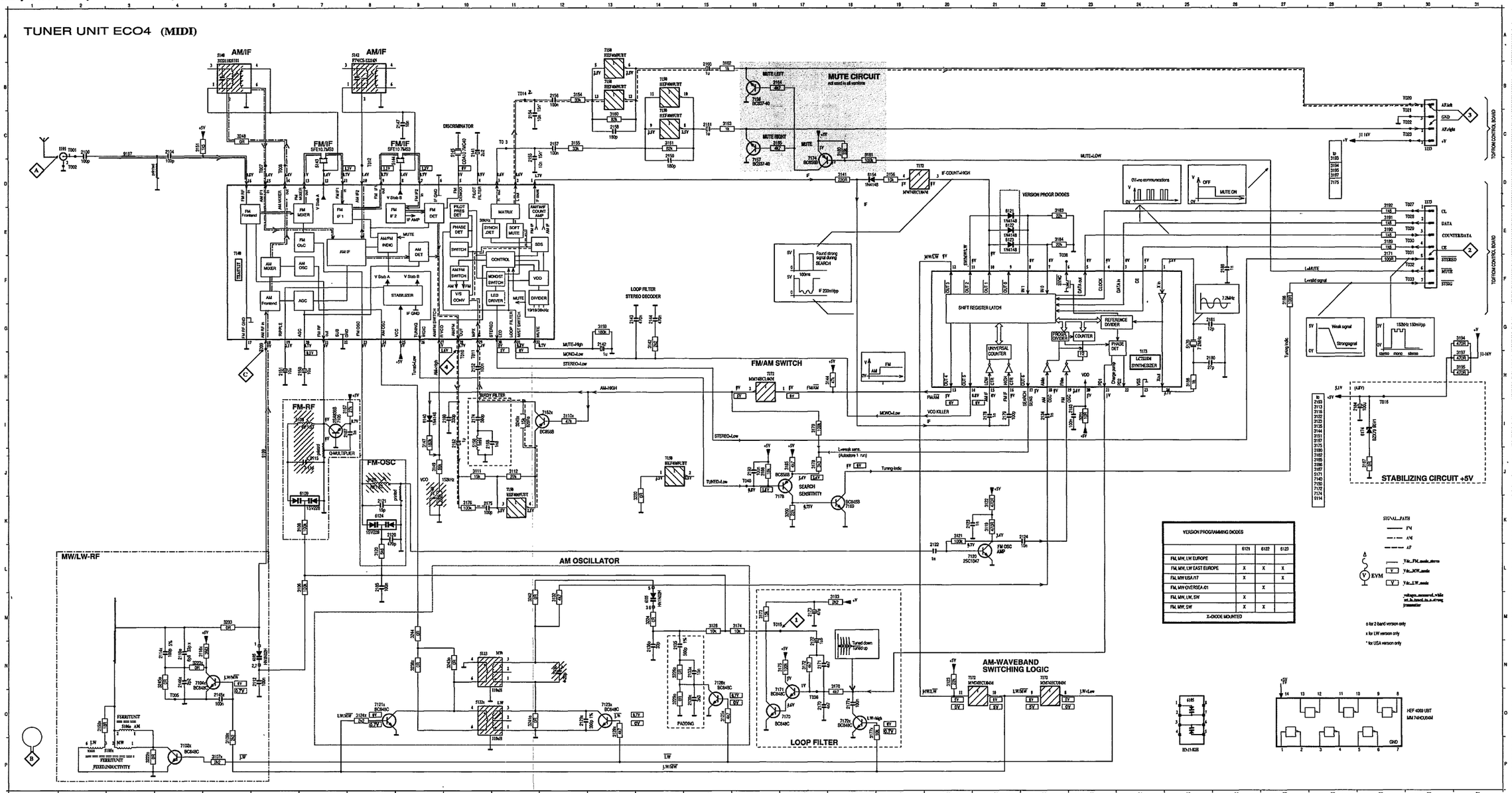
(GB) Warning !
Invisible laser radiation when open
Avoid direct exposure to beam

(S) Varning !
Osynlig laserstrålning när apparaten är oppnad och spärren ar urkopplad Betrakta ej strålen

(SF) Varoitus !
Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömalle laserisäteilylle. Älä katso säteeseen!

(DK) Advarse !
Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion Undgå udsaettelse for stråling.

EC04 (MIDI) CIRCUIT (Not for /22/26)



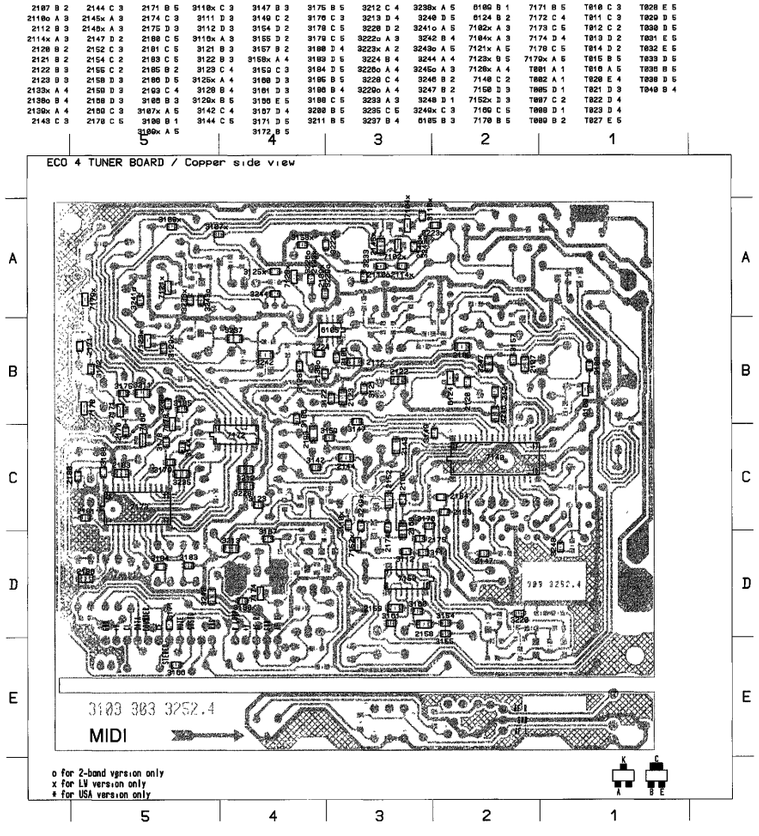
TUNER Adjustment table (ECO 4 FM/MW- and FM/MW/LW - versions with AM-ferrite antenna)

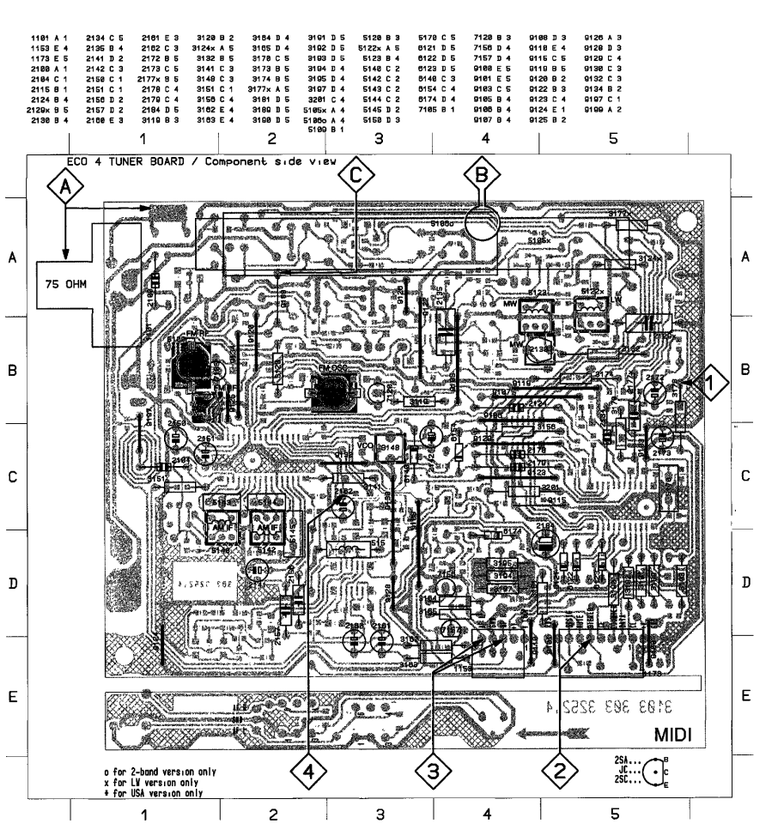
Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT * 1)						
FM 87 5 - 108MHz			108 MHz	5120		8V ± 0.2V
			87.5MHz	check		4.1V ± 0.5V
FM /14 East Europe 65.81 - 108MHz			108 MHz	5120		8V ± 0.2V
			65.81 MHz	check		0.8V ± 0.4V
MW 2-band version, 10kHz grid 530 - 1710kHz			1710kHz	5123	◇1	9V±0.1V (7.5±0.7V)[1]
			530kHz	check		1V±0.4V (1.1±0.5V)[1]
LW 153 - 279kHz			279kHz	5122		8V±0.2V (7.5±1.5V)[1]
			153kHz	check		1V±0.4V (1.1±0.5V)[1]
MW 3-band version 522 - 1611kHz			1611kHz	5123		8V±0.1V (7.5±0.5V)[1]
			522kHz	check		1V±0.4V (1.1±0.5V)[1]
FM - RF						
FM	108MHz	◇A mod=1kHz Δf=22.5kHz	108MHz	2115	◇3	MAX ↕
	87.5MHz		87.5MHz	5109		
FM /14 East Europe	108MHz		108MHz	2115		
	65.81MHz		65.81MHz	5109		
VCO						
FM	98 MHz, 1mV continuous wave	◇A	98MHz	3148	◇2	152kHz ± 1kHz
AM - IF						
MW	540kHz Δf = 10kHz as low as possible	100nF 50E ◇C	540kHz	5142 5140	◇4	symmetrical and max height
AM - RF						
LW	198kHz	◇B mod=1kHz 30% AM	198kHz	5122	◇4	MAX
MW 3-band version	1494kHz		1494kHz	2130		MAX ↕
	549kHz		549kHz	5123		
MW 2-band version, 10kHz grid	1500kHz		1500kHz	2130		
	550kHz		550kHz	5123		

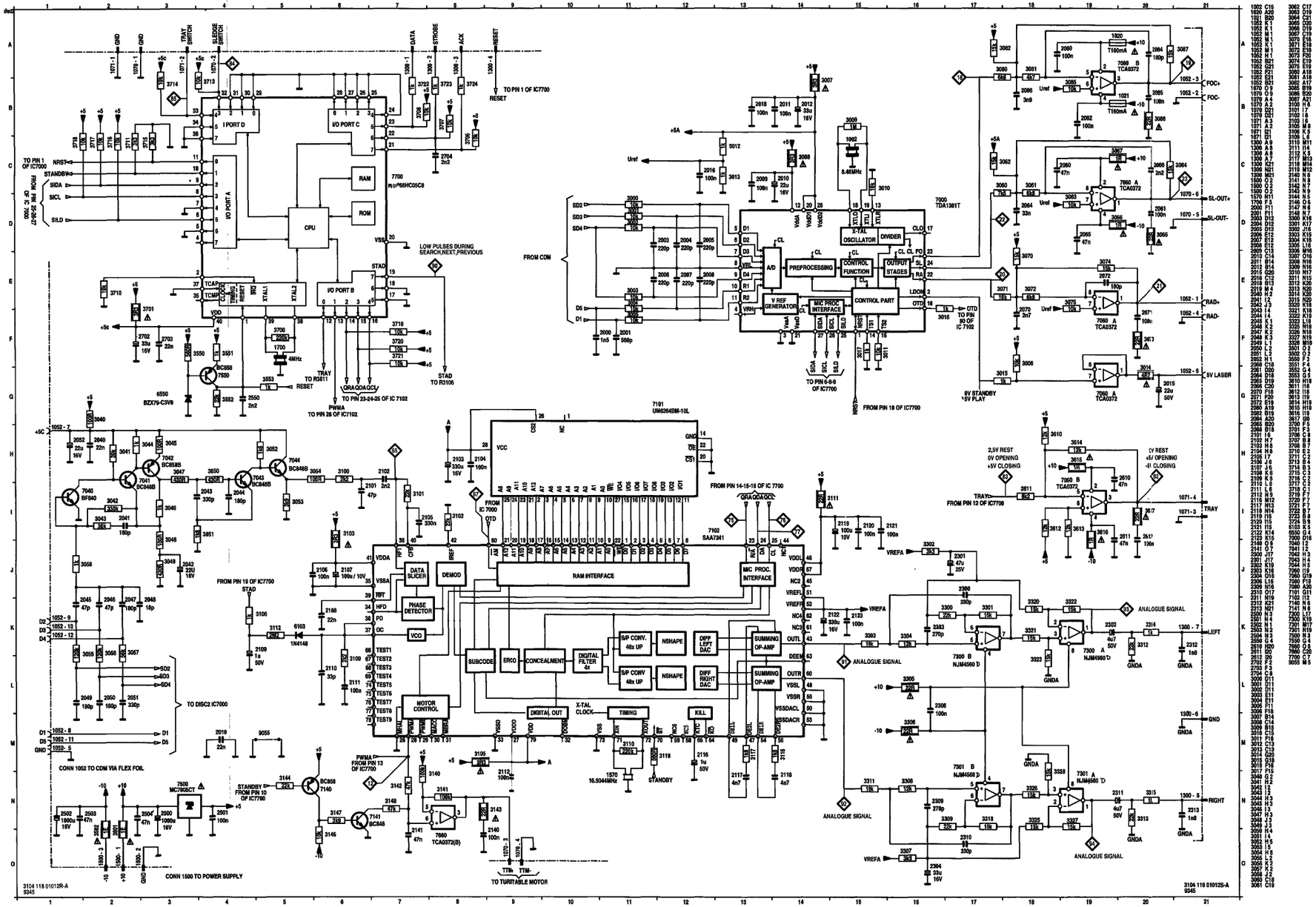
* Use Service Test Program. By selecting the TUNER TEST, test frequencies will be stored as preset frequ. automatically.
1) Adjustment of AM-RF stage influences the varicap voltage. Therefore check if varicap voltage fulfils value stated within brackets after AM-RF adjustment.

↕ repeat

EC04 (MIDI) LAYOUT (Not for /22/26)







ACTIVITY DURING PLAY

ACTIVITY DURING PLAY

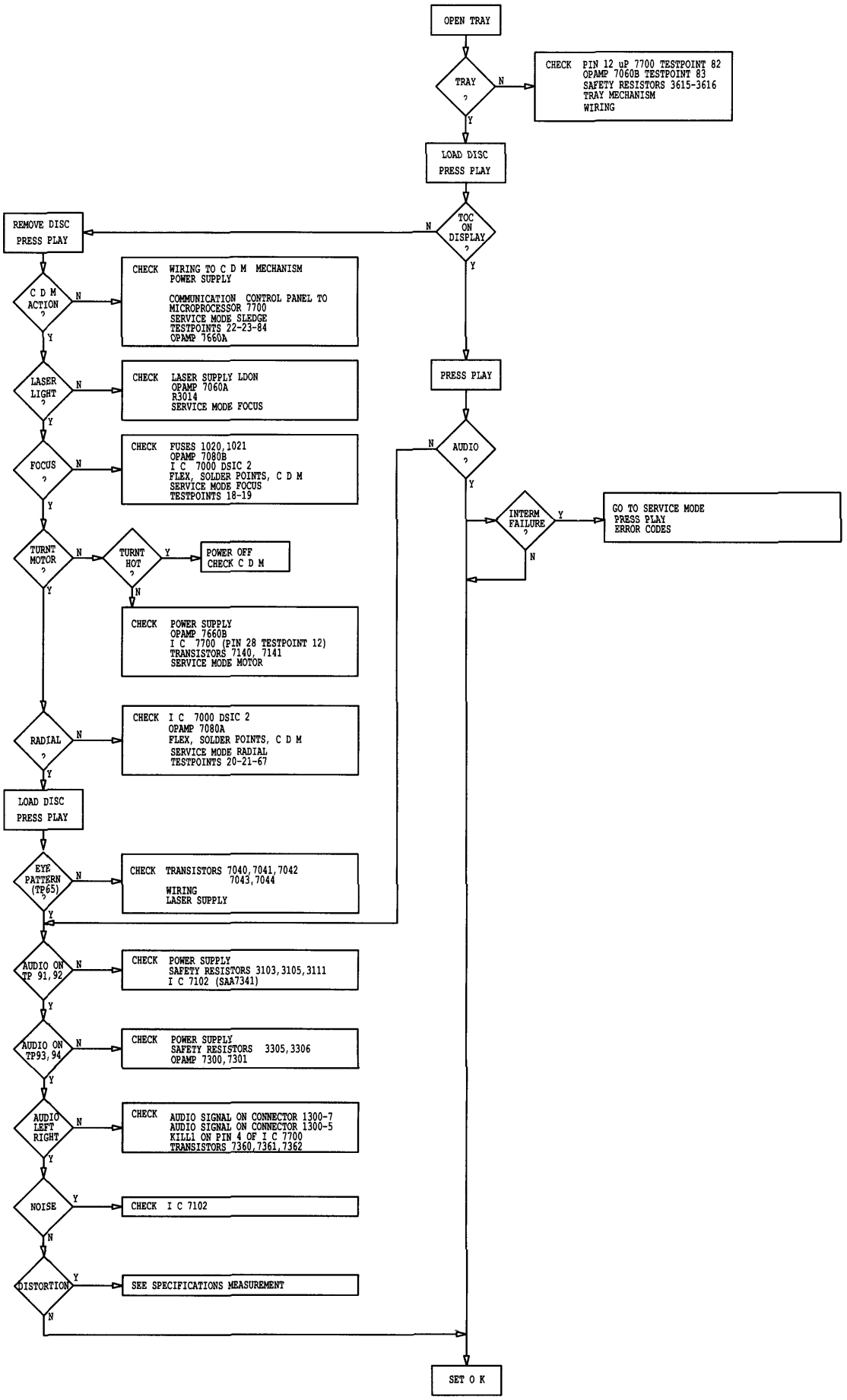
SERVICE POSITION SLEDGE
SL-OUT -2,6V
SL-IN +2,5V

SERVICE POSITION SLEDGE,FOCUS,MOTOR 0V
SERVICE POSITION RADIAL 5V

SERVICE POSITION SLEDGE
0V REST POSITION
+5V WHEN SLEDGE IS MOVING

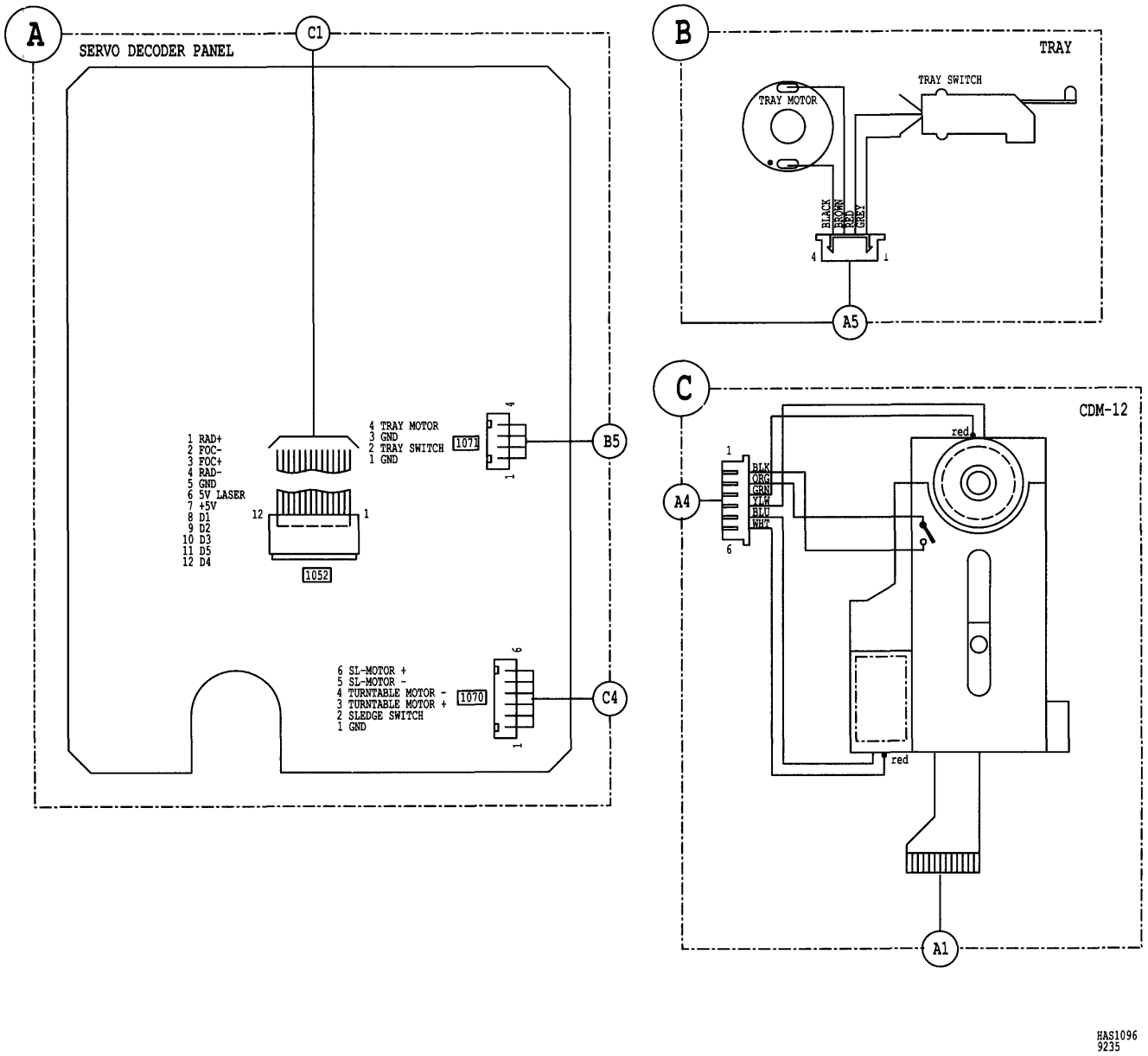
+5V REST POSITION OF TRAY
0V WHEN OPENING OR CLOSING

CD REPAIR CHART



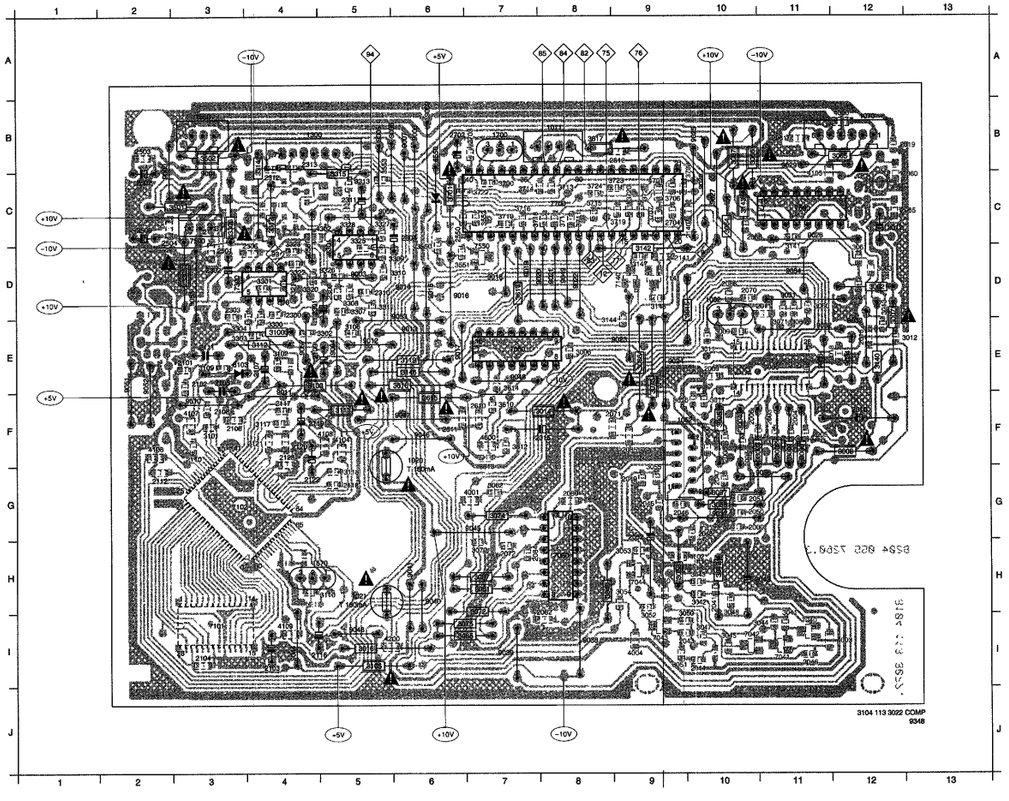
HAS1082
9218

CD WIRING

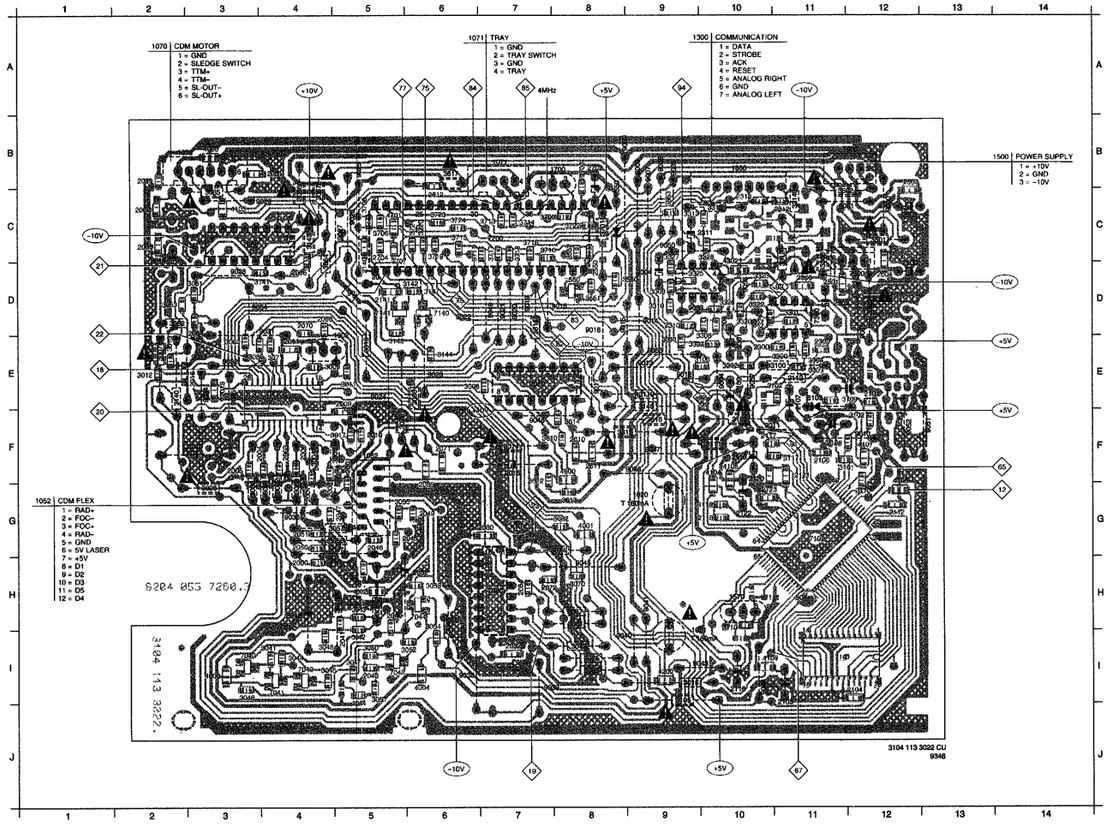


HAS1096
9235

1062	D10	2009	E10	2050	G10	2103	I4	2140	C10	3550	C6	3011	E10	3051	I9	3072	I7	3111	F5	3305	D3	3328	C5	3707	C9	4002	H10	7042	I10	9004	E5	9022	D8	9041	H6
1020	F6	2010	F12	2051	G10	2104	I3	2141	D9	2610	F7	3012	E12	3052	I9	3073	F9	3112	E4	3306	C3	3501	C2	3708	C10	4003	I12	7043	I9	9005	B5	9023	E8	9043	I5
1021	H5	2011	D10	2052	H9	2105	E3	2300	D4	2611	F6	3013	D12	3053	H9	3074	G7	3117	F4	3307	D5	3502	B3	3710	C7	4004	I9	7044	H9	9006	B6	9024	E9	9044	I4
1052	F9	2012	C12	2060	C12	2106	F3	2301	D4	2612	B6	3014	F7	3054	H9	3075	I8	3118	G5	3308	D5	3550	D6	3711	C6	4104	F5	7060	E7	9007	B6	9025	B10	9045	G6
1070	B12	2015	F7	2061	B11	2107	E4	2302	D3	2702	B6	3015	D10	3055	G9	3080	E11	3119	E6	3309	D5	3551	D6	3713	C6	4105	C11	7080	H8	9008	B8	9026	C10	9046	F6
1071	B8	2016	E12	2064	D12	2108	F3	2303	D3	2703	B7	3016	I5	3056	G10	3081	H7	3140	E12	3310	D5	3552	C7	3714	C7	4106	F2	7101	I3	9009	B8	9027	C10	9047	F8
1300	B4	2018	E12	2065	C12	2109	E4	2304	C8	2704	C9	3017	F10	3057	G10	3082	G7	3141	D11	3311	D5	3553	C5	3715	C6	4107	F3	7102	G3	9010	F3	9028	C11	9048	E7
1500	B3	2019	B12	2066	C10	2110	F3	2306	D3	3000	F11	3040	H8	3058	H9	3085	I6	3142	D9	3312	C4	3610	F7	3716	C7	4108	F4	7140	D9	9011	F4	9029	B11	9049	D8
1570	H4	2040	H9	2070	D10	2111	E3	2309	D5	3001	F11	3041	I11	3060	D11	3086	E9	3143	C10	3313	C5	3611	G7	3717	C9	4109	I4	7141	D9	9012	E5	9031	D11	9050	C5
1700	B7	2041	H10	2071	F8	2112	G2	2310	D5	3002	F11	3042	H10	3061	D12	3087	H7	3144	E6	3314	C4	3612	F7	3718	C7	4200	I5	7300	D3	9013	E6	9032	E11	9051	E2
2000	G10	2042	H10	2072	H7	2115	I4	2311	C5	3003	F11	3043	H10	3062	D12	3100	E4	3145	E5	3315	C5	3613	G7	3719	C9	4302	C4	7301	D5	9014	D6	9033	E12	9052	F2
2001	F10	2043	I9	2080	G9	2117	F4	2312	C4	3004	F10	3044	I10	3063	D12	3101	F3	3147	D9	3300	D4	3614	E7	3720	C9	4600	F7	7500	C3	9015	D6	9034	E12	9053	D5
2001	F5	2042	H4	2071	F6	2111	E11	2306	D11	2704	C5	3016	I9	3055	G5	3075	I6	3117	F11	3306	D11	3328	C9	3706	C5	4000	B3	7000	E4	7700	C7	9017	E8	9035	E3	9053	E9
2003	F4	2043	I5	2072	H7	2112	G12	2309	D10	3000	G3	3017	F4	3056	G4	3080	E3	3118	G9	3307	E9	3501	C12	3707	D5	4001	G8	7340	I3	9000	C12	9018	D7	9036	G4	9054	D3
2004	F4	2044	J5	2080	H8	2116	I10	2310	D9	3001	G4	3060	I6	3057	G4	3081	H8	3119	E9	3308	E9	3502	C11	3708	C5	4002	H5	7041	I4	9001	C11	9019	D7	9037	G4	9055	E12
2005	F3	2045	G5	2082	I7	2117	F10	2311	C9	3002	G4	3041	I3	3058	H5	3082	G8	3140	E2	3309	D9	3590	D8	3710	C7	4003	I3	7042	I4	9003	D9	9020	D7	9038	I8	9056	D10
2006	F4	2046	G5	2084	H7	2118	G9	2312	C11	3003	G4	3042	I5	3060	E3	3083	I6	3141	D3	3310	D9	3551	D8	3711	C8	4004	I5	7043	I5	9004	E10	9021	D7	9039	I7	9057	E10
2007	G4	2047	G5	2085	G8	2119	F10	2313	C10	3004	F4	3043	H5	3061	D3	3086	E8	3142	D5	3311	E9	3552	C8	3713	C7	4104	F10	7044	H6	9005	B9	9022	D6	9040	I8		
2008	F10	2049	G9	2102	E3	2123	F4	2504	C2	3010	F9	3050	I9	3071	E11	3110	H5	3304	E3	3327	C5	3706	C9	4001	G8	7091	I11	9003	D5	9021	D8	9040	H6				



1002	E5	2008	G4	2048	H5	2086	D4	2120	F10	2500	D12	3005	F5	3044	I4	3062	D2	3087	H8	3143	C4	3312	D11	3553	C9	3714	C7	4105	C3	7060	E7	9006	B9	9023	E6	9041	H9
1020	D9	2009	E5	2049	G6	2101	E12	2121	F11	2501	D11	3006	E5	3045	I4	3063	G2	3100	E10	3144	E6	3313	C9	3610	F7	3715	C6	4106	D12	7080	H7	9007	B9	9024	E5	9043	I9
1021	I9	2010	F3	2050	G4	2102	F12	2122	G10	2502	C12	3007	E2	3046	I3	3064	D4	3101	F11	3146	F9	3314	C11	3611	D7	3716	C7	4107	F12	7101	I11	9008	B9	9025	B5	9044	I10
1062	F5	2011	E4	2051	G4	2103	J11	2123	G10	2503	B12	3008	G3	3047	I5	3065	C3	3102	E10	3147	D6	3315	C10	3612	G7	3717	D7	4108	F10	7102	G11	9009	B9	9026	C5	9045	H8
1070	B2	2013	C2	2052	H6	2104	I11	2140	D6	2504	D12	3009	E4	3048	I4	3066	C4	3103	F10	3148	E5	3320	D10	3613	G8	3718	D7	4109	I10	7140	D6	9010	F12	9027	C5	9046	F8
1071	B7	2015	F7	2060	C2	2105	F11	2141	D6	2550	D6	3010	F6	3049	H5	3067	C4	3105	I9	3300	E10	3321	D10	3614	F8	3719	C6	4200	I9	7141	D5	9011	F10	9028	D3	9047	F9
1300	B10	2016	E3	2061	B4	2106	F11	2300	E10	2610	F6	3011	E3	3050	I5	3070	H8	3106	E9	3301	D11	3322	D10	3615	F6	3720	C6	4302	D10	7300	D11	9012	E9	9029	C3	9048	F7
1500	B11	2018	E3	2064	E3	2107	F11	2301	E10	2611	F8	3012	E2	3051	I6	3071	E4	3109	E11	3302	E10	3323	D10	3616	F9	3721	C8	4600	F8	7301	D10	9013	E9	9031	D3	9049	D7
1570	H10	2019	B2	2065	C2	2108	F11	2302	D11	2612	C6	3013	E2	3052	I5	3072	I8	3110	I10	3303	E11	3325	D9	3617	B6	3722	C8	4701	C5	7500	D12	9014	D9	9032	E3	9050	C9
1700	B7	2040	H5	2066	D4	2109	E10	2303	E11	2702	B8	3014	F7	3053	H8	3073	F5	3111	F10	3304	E11	3326	D10	3700	C7	3723	C6	6103	E11	7550	D8	9015	D8	9033	E3	9051	F13
2000	H4	2041	I5	2070	D4	2110	G12	2304	D9	2703	B8	3015	E5	3054	I4	3074	G2	3112	E11	3305	D12	3327	C9	3701	C8	3724	C6	6550	C6	7560	C3	9016	D6	9034	E3	9052	F12
2001	F5	2042	H4	2071	F6	2111	E11	2306	D11	2704	C5	3016	I9	3055	G5	3075	I6	3117	F11	3306	D11	3328	C9	3706	C5	4000	B3	7000	E4	7700	C7	9017	E8	9035	E3	9053	E9
2003	F4	2043	I5	2072	H7	2112	G12	2309	D10	3000	G3	3017	F4	3056	G4	3080	E3	3118	G9	3307	E9	3501	C12	3707	D5	4001	G8	7340	I3	9000	C12	9018	D7	9036	G4	9054	D3
2004	F4	2044	J5	2080	H8	2116	I10	2310	D9	3001	G4	3060	I6	3057	G4	3081	H8	3119	E9	3308	E9	3502	C11	3708	C5	4002	H5	7041	I4	9001	C11	9019	D7	9037	G4	9055	E12
2005	F3	2045	G5	2082	I7	2117	F10	2311	C9	3002	G4	3041	I3	3058	H5	3082	G8	3140	E2	3309	D9	3590	D8	3710	C7	4003	I3	7042	I4	9003	D9	9020	D7	9038	I8	9056	D10
2006	F4	2046	G5	2084	H7	2118	G9	2312	C11	3003	G4	3042	I5	3060	E3	3083	I6	3141	D3	3310	D9	3551	D8	3711	C8	4004	I5	7043	I5	9004	E10	9021	D7	9039	I7	9057	E10
2007	G4	2047	G5	2085	G8	2119	F10	2313	C10	3004	F4	3043	H5	3061	D3	3086	E8	3142	D5	3311	E9	3552	C8	3713	C7	4104	F10	7044	H6	9005	B9	9022	D6	9040	I8		



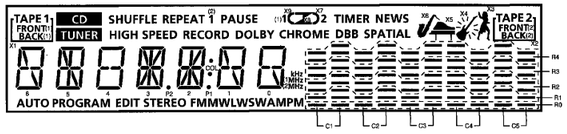
FRONT CIRCUIT

SYMBOL	DESCRIPTION
#	For FW46 only
*	For FW56 only
<>	FOR SPECTRUM VERSION
@	FOR NON SPECTRUM VERSION

NOTE :

1 ALL VOLTAGE ARE DC WITH TOLERANCE OF +-5 %

2 THE SET IS IN ON STATE



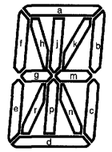


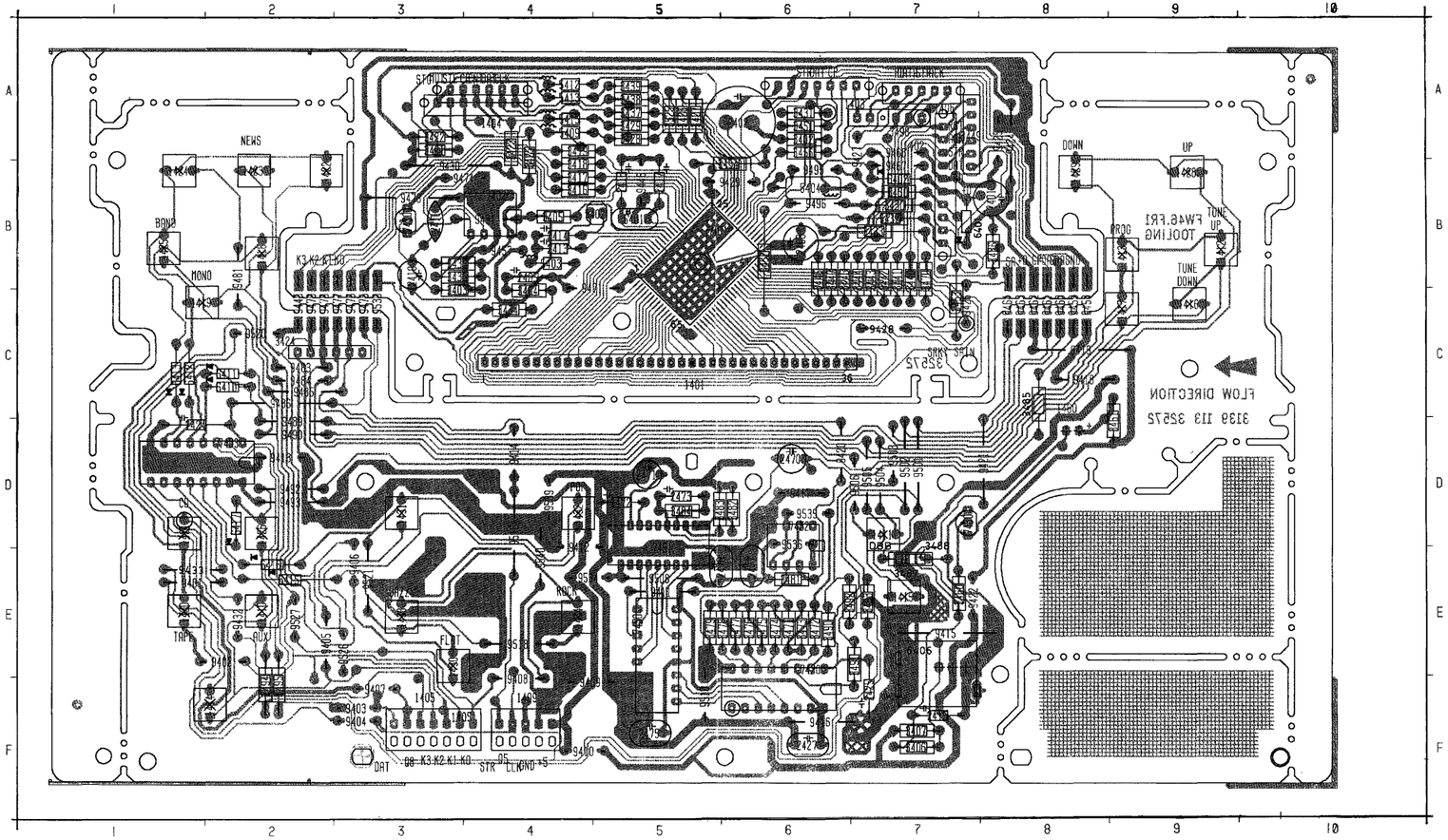
Figure 7. LCD pin connections

LCD DISPLAY PINS CONNECTIONS

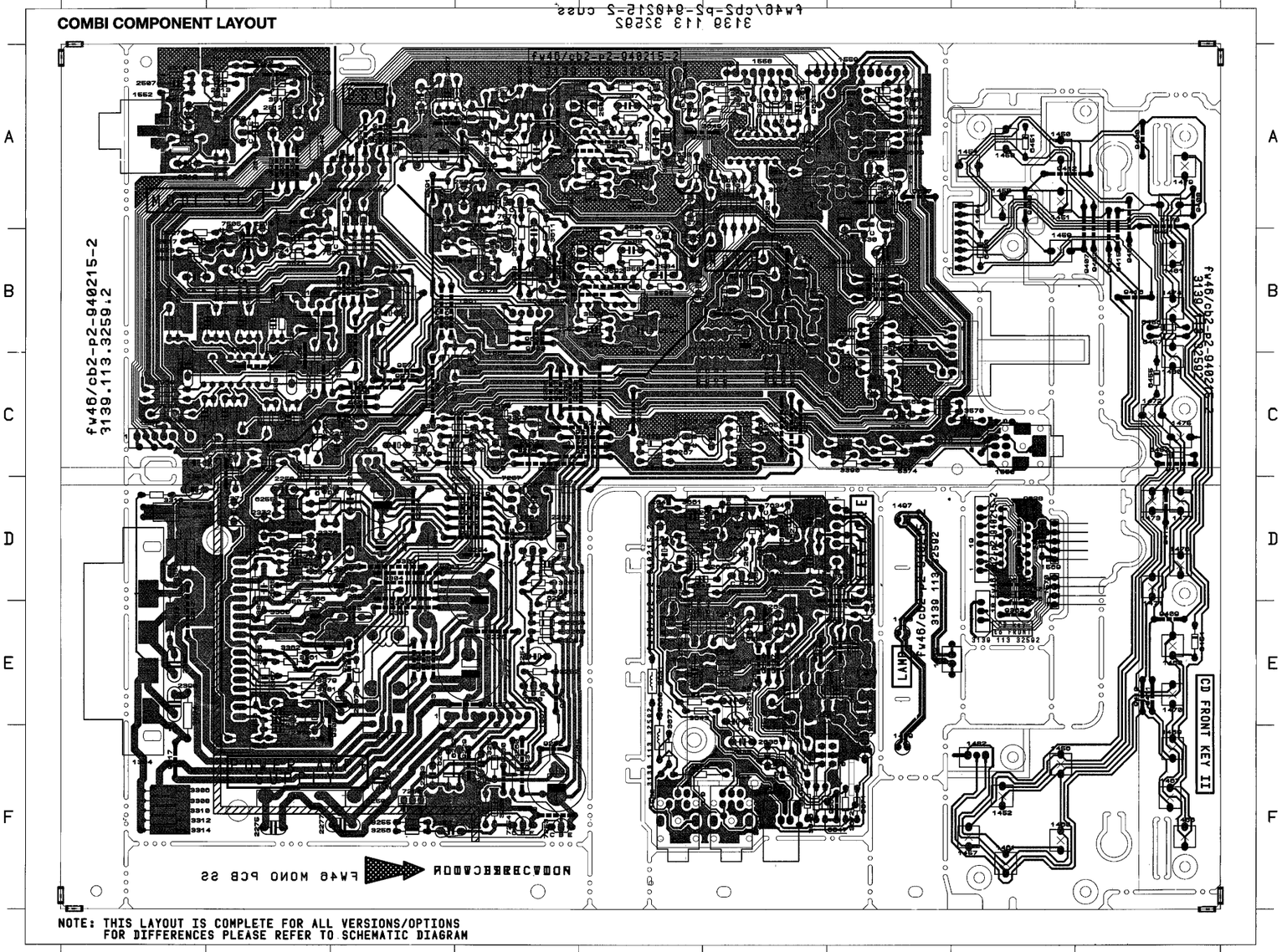
PIN NO.	COM 0	COM 1	COM 2	COM 3
1	-	-	COM 2	-
2	-	-	-	COM 3
3	6gm	6f	6e	6n
4	6b	6a	6c	6d
5	FRONT (1)	6h	BACK (1)	TAPE 1,X1
6	SHUFFLE	CD	HIGH SPEED	AUTO
7	5g	5f	5e	PROGRAM
8	5b	5a	5c	5d
9	TUNER	5hn	5m	5jp
10	1 (1), 2	TIMER	RECORD	REPEAT
11	4gm	4f	4e	EDIT
12	4b	4a	4c	4d
13	X7	X9	X8	1 (2)
14	FRONT (2)	X6	BACK (2)	TAPE 2,X2
15	3g	3f	3e	3n
16	3b	3a	3c	3d
17	3k	3h	3m	3jp
18	3r	DBB	PAUSE	STEREO
19	2gm	2f	2e	2n
20	2b	2a	2c	2d
21	2kr	CHROME	DOLBY	2jp
22	LW	-	MW	R0
23	1gm	1f	1e	1n
24	1b	1a	1c	1d
25	COL	1h	FM,P1,MHz (1)	SW,P2,MHz (2)
26	X4	kHz	PM	AM
27	0gm	0f	0e	0n
28	0b	0a	0c	0d
29	X3	X5	SPATIAL	NEWS
30	C1R1	C1R2	C1R3	C1R4
31	C2R1	C2R2	C2R3	C2R4
32	C3R1	C3R2	C3R3	C3R4
33	C4R1	C4R2	C4R3	C4R4
34	C5R1	C5R2	C5R3	C5R4
35	COM 0	-	-	-
36	-	COM 1	-	-

FRONT COMPONENT LAYOUT

1401 C5 1412 B9 1421 D1 1431 D3 2410 B3 2427 F6 3403 C4 3421 B3 3430 B7 3439 A5 3449 A7 3470 C7 3479 E5 3490 E6 5402 B5 6406 E7 7402 B4 9402 E2 9411 E5 9420 D6 9430 B4 9461 C8 9475 C3 9486 C2 9503 D7 9521 E3
1402 A7 1413 B9 1422 B3 1432 D4 2411 B3 2470 D6 3404 C4 3422 A3 3431 A6 3440 C7 3450 B7 3471 E6 3481 E6 3491 F6 5403 B4 6410 C2 7403 D2 9403 F3 9412 E4 9421 D8 9431 B4 9462 C8 9476 C3 9489 D2 9504 D7 9526 F2
1403 A7 1414 F2 1423 B2 1433 E3 2413 B4 2471 D5 3405 B4 3423 A4 3432 B7 3441 C7 3451 A6 3472 E6 3482 D5 3492 E6 5404 B6 6411 C2 7410 B3 9404 F3 9413 D2 9422 E7 9432 E2 9463 C8 9477 C2 9490 D2 9505 D7 9527 E2
1404 A4 1415 E7 1424 B1 1434 E4 2414 B4 2472 D5 3406 F7 3424 C2 3433 B7 3442 C7 3452 B6 3473 E6 3483 D5 3493 E7 5409 A4 6412 C1 7420 F6 9405 F2 9414 D4 9424 A8 9445 C2 9464 C8 9478 C2 9492 D2 9506 D6 9530 C3
1405 F3 1416 C9 1425 B1 1460 C8 2415 F7 2473 D5 3407 F7 3425 A4 3434 C4 3443 C7 3453 B7 3474 E6 3484 D5 3494 F2 5412 A4 6413 C1 7450 E5 9406 E3 9415 E7 9425 B8 9446 B5 9466 B7 9479 C2 9493 D2 9508 E5 9534 E5
1406 A7 1417 C9 1426 D2 2401 B8 2417 B5 2475 F5 3416 B4 3426 A5 3435 B4 3444 C6 3454 B6 3475 E6 3485 D8 3495 F2 5413 A4 6415 E2 7451 D5 9407 F3 9416 F6 9426 C7 9457 B4 9467 B7 9481 B2 9495 B6 9510 F5 9535 D6
1409 F4 1418 B2 1428 B9 2402 A6 2418 B5 2476 E6 3417 B4 3427 A5 3436 C4 3445 C6 3456 B6 3476 E6 3486 B7 3498 A7 5415 A4 6416 E2 7452 D6 9408 F4 9417 D6 9427 A7 9458 C8 9471 C5 9483 C2 9496 B6 9516 E4 9536 E6
1410 E2 1419 C2 1429 B8 2403 B6 2424 D2 2477 E6 3418 B4 3428 A5 3437 A5 3446 C6 3460 E7 3477 E6 3487 E7 3525 A5 6401 B7 6417 D2 7460 E7 9409 F5 9418 C8 9428 C7 9459 C8 9473 B3 9484 C2 9501 D7 9518 E4 9539 D4
1411 D7 1420 E1 1430 F4 2405 C4 2425 E7 3402 A6 3419 B4 3429 A5 3438 A5 3447 C6 3461 D8 3478 E5 3488 E7 5401 B5 6402 B7 7401 B5 9401 E2 9410 F4 9419 C8 9429 B6 9460 C8 9474 B4 9485 C2 9502 D7 9520 C2 9540 D4



COMBI COMPONENT LAYOUT



NOTE: THIS LAYOUT IS COMPLETE FOR ALL VERSIONS/OPTIONS
FOR DIFFERENCES PLEASE REFER TO SCHEMATIC DIAGRAM

61

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10	E 8	2388	D 3	3254	E 4	3535	A 6	3649	A 6	7530	A 7	9560	B 3
19	D 8	2389	E 1	3255	F 3	3536	A 6	3652	F 6	7571	A 7	9561	B 3
1253	C 3	2390	E 1	3256	F 3	3538	C 1	3653	E 6	7572	A 7	9562	B 3
1304	E 1	2391	C 1	3257	F 4	3539	C 1	3654	E 6	7575	A 4	9563	B 2
1450	A 8	2392	D 1	3258	F 4	3541	A 3	3655	E 6	7576	B 4	9564	C 2
1451	A 8	2450	D 8	3259	D 4	3542	A 3	3656	E 6	7577	A 5	9565	C 2
1452	F 8	2451	D 8	3260	F 4	3543	B 3	3657	E 7	7578	B 5	9566	C 2
1454	A 8	2501	B 2	3261	D 4	3545	A 5	3659	F 6	7581	A 5	9567	C 3
1455	A 8	2502	C 2	3262	D 4	3546	A 6	3659	E 7	7582	B 5	9569	C 3
1456	F 8	2505	B 2	3263	E 4	3547	A 5	3661	D 5	7583	A 4	9569	C 3
1457	F 8	2506	C 2	3264	C 5	3548	B 5	3662	D 6	7630	E 5	9571	C 3
1458	A 8	2507	A 1	3265	C 6	3549	A 2	3663	D 5	7631	E 5	9572	C 3
1459	B 8	2508	A 2	3266	C 6	3554	A 7	3664	D 5	7632	E 6	9580	A 3
1460	F 8	2509	A 1	3267	C 5	3555	A 7	3665	D 5	7633	E 7	9581	A 3
1461	F 8	2510	A 1	3268	C 3	3556	A 7	3666	D 6	7634	D 6	9582	A 3
1466	F 9	2511	A 2	3269	C 2	3557	A 6	3667	D 5	7635	D 6	9584	A 3
1467	F 9	2512	A 2	3270	C 3	3565	C 7	3668	D 6	7636	D 6	9585	A 4
1468	E 9	2513	B 2	3271	D 4	3566	B 7	3669	D 5	7637	A 5	9586	A 4
1469	F 9	2514	C 1	3301	C 3	3567	A 7	3671	F 7	9200	C 4	9587	A 4
1470	E 9	2515	B 1	3302	C 3	3568	A 7	3672	F 7	9201	C 4	9588	A 4
1471	D 9	2516	B 2	3303	C 4	3569	C 7	3673	F 6	9202	C 4	9589	A 5
1472	C 9	2517	B 1	3304	C 4	3570	C 7	3674	D 6	9203	C 4	9590	A 5
1473	D 9	2518	B 2	3305	D 1	3571	A 7	3675	E 7	9204	C 4	9591	A 3
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1479	A 9	2571	C 8	3311	D 1	3577	A 4	3681	A 6	9211	C 4	9599	B 5
1480	C 9	2572	A 3	3312	F 1	3578	A 4	3682	A 6	9212	C 5	9600	B 3
1481	B 9	2575	A 5	3313	D 1	3579	A 3	3683	A 6	9213	C 5	9601	B 3
1482	F 9	2576	B 5	3314	F 1	3580	A 4	3684	A 6	9214	C 5	9602	B 4
1484	B 8	2577	A 4	3315	C 2	3581	A 4	3685	A 6	9215	C 5	9603	B 4
1497	D 7	2578	B 4	3316	D 1	3582	B 4	3686	A 6	9216	C 6	9607	A 7
1498	E 7	2579	A 4	3351	E 2	3583	A 4	5313	E 3	9217	C 6	9610	A 7
1499	F 7	2580	B 3	3300	E 2	3584	B 4	5373	C 7	9218	C 6	9611	B 6
1550	C 8	2581	A 3	3301	E 2	3585	A 4	5374	C 7	9219	D 4	9612	B 7
1551	F 6	2582	A 4	3302	E 2	3587	A 5	5530	F 6	9220	D 4	9613	B 7
1552	A 1	2583	A 5	3303	E 3	3588	B 5	5531	E 5	9221	D 4	9614	B 7
1553	F 7	2584	B 5	3308	E 3	3589	A 5	5532	B 3	9222	D 4	9615	B 7
1554	A 3	2585	A 5	3371	F 2	3590	B 5	6250	F 2	9223	D 4	9620	A 5
1557	C 1	2586	B 5	3372	D 2	3591	A 5	6251	C 5	9224	D 4	9621	A 6
1558	A 6	2587	A 5	3373	F 2	3592	B 5	6252	E 4	9225	D 4	9636	E 8
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1560	B 4	2591	A 5	3375	E 2	3594	B 5	6254	E 4	9227	E 4	9659	D 8
1561	B 4	2592	B 5	3376	D 2	3595	A 5	6255	D 2	9228	E 4	9650	E 6
1562	F 5	2593	A 5	3377	E 2	3596	B 5	6256	D 3	9229	F 4	9652	E 7
1563	E 8	2594	B 5	3378	D 2	3597	A 5	6257	D 2	9230	F 4	9653	E 6
1564	B 2	2595	A 4	3379	E 2	3598	B 5	6258	D 2	9231	F 4	9654	E 7
1566	D 7	2596	B 4	3380	D 2	3599	A 5	6259	C 6	9232	F 4	9655	E 6
1557	E 4	2597	B 4	3381	E 2	3600	B 5	6260	D 4	9233	F 4	9656	E 6
1568	B 4	2600	B 6	3382	D 3	3601	A 5	6261	C 3	9234	D 3	9658	F 6
1569	D 8	2601	B 7	3383	E 1	3602	B 5	6262	F 4	9300	C 2	9661	F 7
1570	D 8	2602	A 7	3384	E 1	3607	A 4	6263	F 3	9301	C 3	9700	A 7
2252	F 4	2603	A 6	3385	E 2	3608	B 4	6264	C 2	9302	D 3		
2253	F 3	2605	B 3	3386	D 2	3609	A 4	6265	C 6	9303	D 3		
2254	E 4	2607	A 3	3387	C 7	3610	B 4	6266	C 6	9304	D 3		
2255	F 3	2608	A 4	3388	C 7	3611	B 4	6352	C 4	9305	D 3		
2256	D 4	2609	A 3	3389	C 7	3612	B 4	6450	B 8	9306	E 3		
2258	D 2	2613	A 2	3390	C 7	3613	B 6	6451	A 8	9307	C 4		
2259	D 3	2614	A 2	3397	C 2	3614	B 6	6452	C 9	9308	C 4		
2260	D 3	2615	A 6	3398	C 2	3615	B 5	6454	E 9	9309	E 3		
2261	D 2	2616	A 6	3399	C 4	3616	B 6	6455	C 9	9310	E 3		
2262	D 4	2629	A 2	3400	C 4	3617	B 6	6456	B 9	9311	E 3		
2263	C 6	2630	E 6	3501	B 2	3618	B 6	6457	B 9	9312	E 1		
2264	D 4	2631	E 6	3502	C 2	3619	B 6	6504	A 7	9316	F 2		
2265	D 4	2632	E 6	3503	B 2	3620	A 6	6505	A 7	9317	F 1		
2266	C 3	2633	E 6	3504	C 2	3621	A 1	6507	B 6	9302	E 8		
2267	C 4	2634	E 6	3505	B 1	3622	A 1	6508	B 6	9400	A 9		
2268	F 4	2635	F 6	3506	C 2	3623	A 6	7250	E 4	9401	A 9		
2271	D 4	2636	F 6	3507	B 1	3624	A 6	7252	F 3	9402	B 9		
2272	E 4	2637	F 7	3508	C 2	3625	C 7	7253	F 4	9403	A 8		
2274	F 3	2638	A 5	3509	C 3	3626	B 7	7254	F 4	9404	B 9		
2275	F 2	2640	D 6	3510	C 2	3627	A 7	7255	D 4	9406	A 9		
2277	F 3	2641	E 7	3511	B 2	3628	A 7	7256	C 5	9407	B 9		
2364	C 3	2642	D 6	3512	C 2	3629	B 7	7257	D 4	9408	A 9		
2365	D 2	2643	D 5	3513	A 1	3630	B 7	7318	C 4	9409	E 9		
2366	E 2	2644	D 6	3514	A 2	3631	E 7	7319	C 3	9410	E 9		
2367	E 2	2645	D 6	3515	A 2	3632	E 5	7320	C 4	9411	E 9		
2368	E 2	2646	D 5	3516	A 2	3633	E 6	7358	E 2	9412	A 8		
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2370	C 7	2648	D 6	3518	A 2	3635	E 6	7502	A 6	9415	B 9		
2371	D 2	2649	D 6	3519	B 2	3636	D 5	7503	A 2	9416	B 9		
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2375	E 2	2653	E 5	3523	B 1	3640	E 6	7513	A 7	9550	A 2		
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2380	D 2	2658	D 6	3530	B 2	3645	F 6	7524	B 6	9555	B 2		
2385	E 3	2659	D 5	3531	A 3	3646	F 6	7525	B 6	9556	A 3		
2386	D 3	3251	F 4	3532	A 3	3647	F 6	7526	B 6	9557	B 3		
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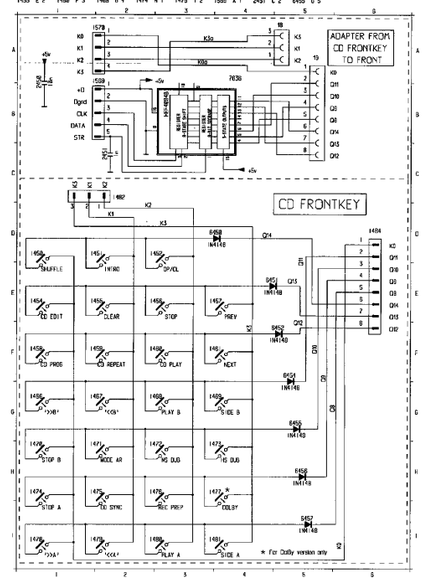
COMBI CIRCUIT I



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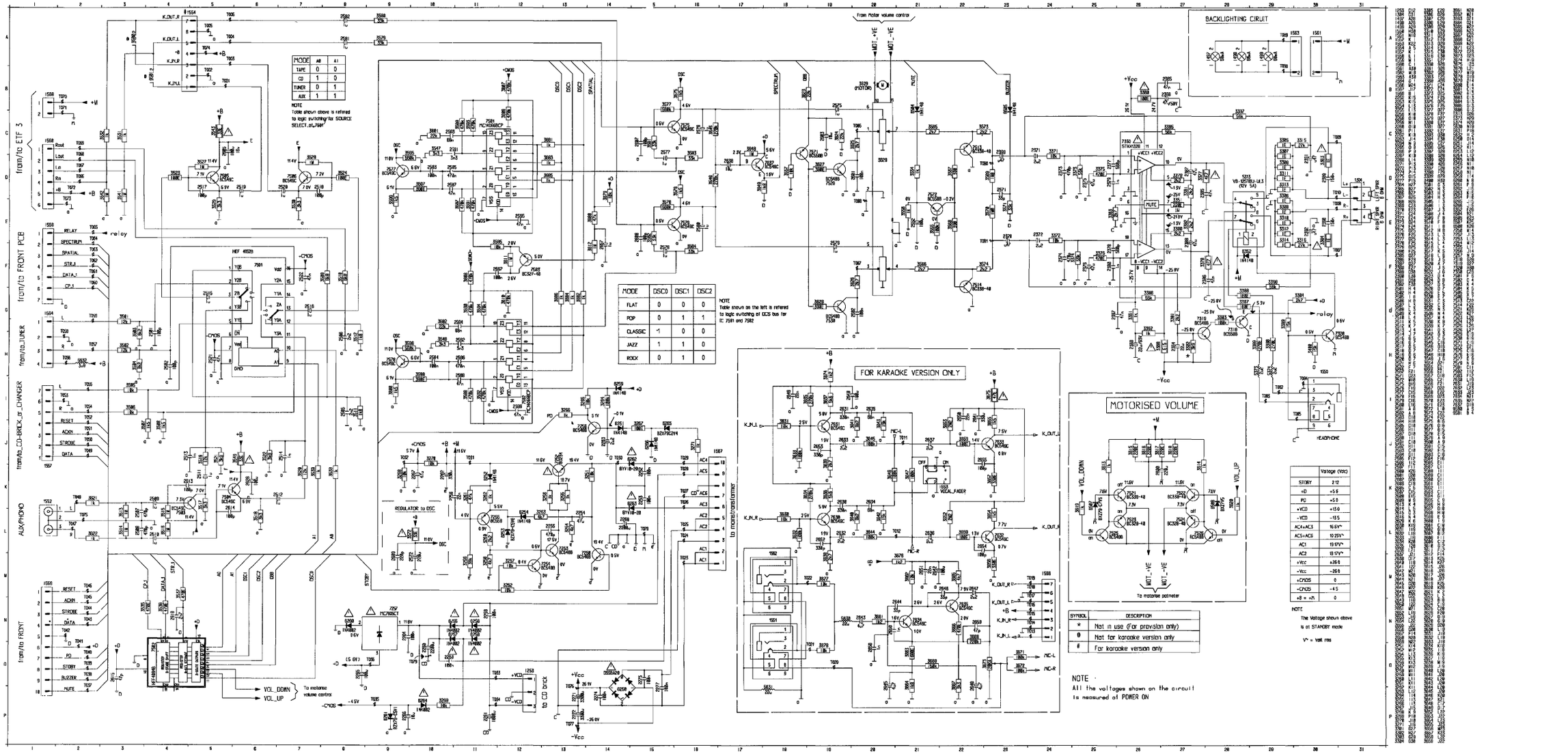
COMBI CIRCUIT II


from/to ETF 3
from/to FRONT PCB
from/to TUNER
from/to_CD-BRICK_or_CHANGER
AUX/PHONO
from/to FRONT
BACKLIGHTING CIRUIT
FOR KARAOKE VERSION ONLY
MOTORISED VOLUME
VOL_DOWN
VOL_UP
To motorise potmeter
HEADPHONE
REGULATOR to OSC
to CD brick
to monstransformer
From Motor volume control
To motorise volume control
MODE | A0 | A1
TAPE | 0 | 0
CD | 1 | 0
TUNER | 0 | 1
AUX | 1 | 1
NOTE
Table shown above is refered to logic switching for SOURCE SELECT. of 7581
MODE | DSC0 | DSC1 | DSC2
FLAT | 0 | 0 | 0
POP | 0 | 1 | 1
CLASSIC | -1 | 0 | 0
JAZZ | 1 | 1 | 0
ROCK | 0 | 1 | 0
NOTE
Table shown on the left is refered to logic switching of DCS bus for IC 7581 and 7582
SYMBOL | DESCRIPTION
* | Not in use (For provision only)
@ | Not for karaoke version only
# | For karaoke version only
NOTE :
All the voltages shown on the circuit is measured at POWER ON
NOTE
The Voltage shown above is at STANDBY mode
V* = Volt rms

64 65 66

PCS 64 006

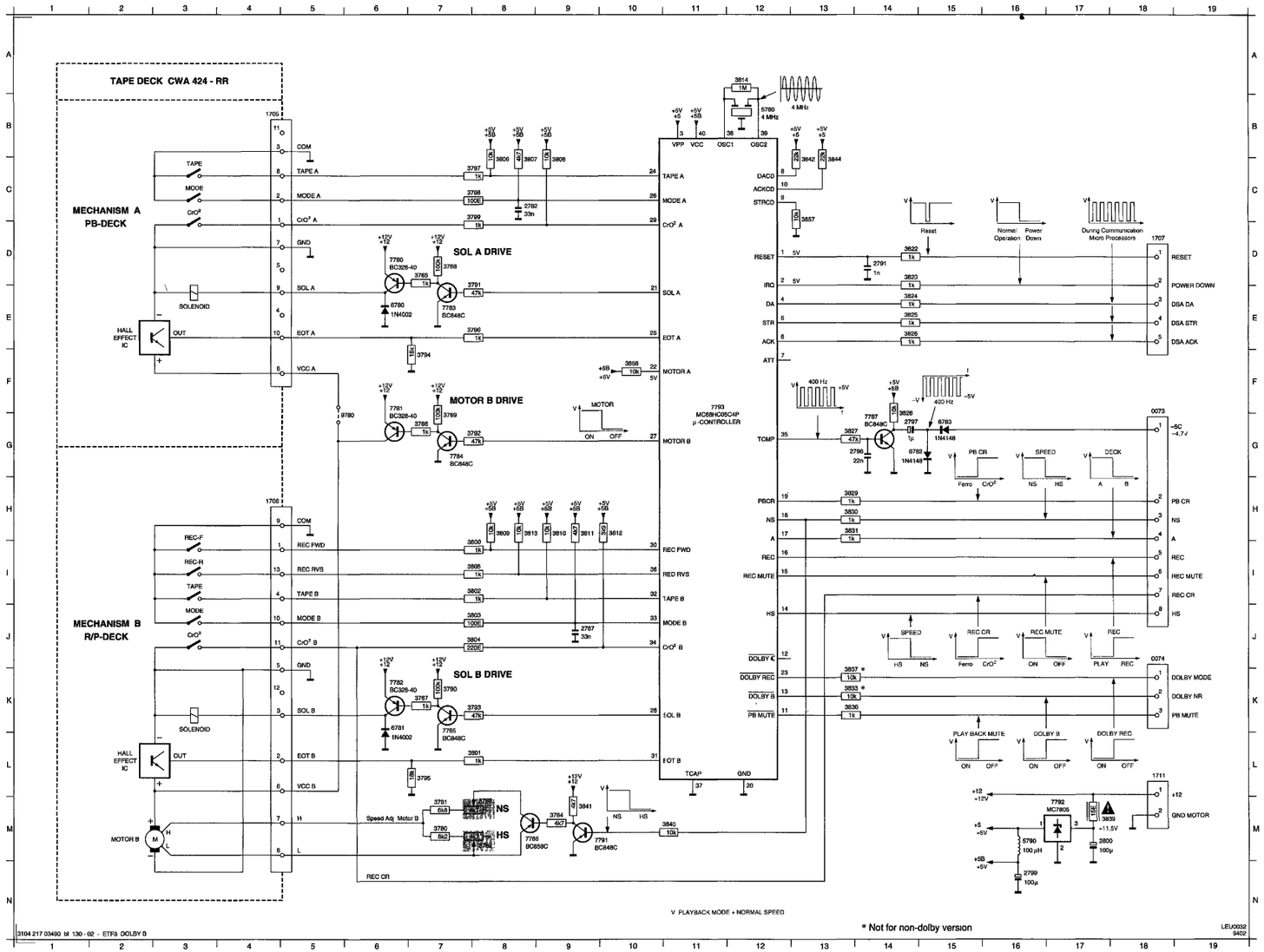
EXPLANATION OF ABBREVIATIONS

A	Deck A or B
CRO2	Chrome
Dolby NR	Dolby Noise Reduction
Dolby Mode	Dolby Mode (Rec or Play)
DSA STR	DSA Strobe
DSA DA	DSA Data
DSA ACK	DSA Acknowledge
EOT A	End of Tape A
EOT B	End of Tape B
FE	Ferro
HS	High Speed
MODE A	Slide Deck A Up / Down
MODE B	Slide Deck B Up / Down
NC	Not Connect
NS	Normal Speed
PB CR	Playback Chrome
PB mute	Playback mute
PB Lever ADJ L	Playback Lever Adjustment Left
PB CR	Playback Chrome
PB mute	Playback mute
PB Lever ADJ R	Playback Lever Adjustment Right
PBL	Playback Left
PBR	Playback Right
Rec Mute	Recording Mute
Rec R	Recording Right
Rec L	Recording Left
Rec CR	Recording Chrome
REC RVS	Recording Reverse
REC	Recording
REC FWD	Recording Forward
SOL A	Solenoid A
SOL B	Solenoid B
VCC B	VCC Motor B

µProcessor 7793 pinning , values , In- Output Port

Pin	Discription	I/O PORT	Values
1	Reset	I	Must be driven by external reset circuitry
2	IRQ	I	0 = Power down 1 = normal operation
3	VPP	-	+5V
4	Date	I/O	DSA bus data line
5	Strobe	I/O	DSA bus clock line
6	Acknowledge	I/O	DSA bus acknowledge line
7	Attenuate	O	0 = Off 1 = On
8	DSA CD Data	I/O	DSA CD bus data line
9	DSA CD Strobe	I/O	DSA Bus strobe line
10	DSA CD Acknowledge	I/O	DSA CD bus Acknowledge line
11	Playback Mute	O	0 = Playback mute On
12	Dolby C	O	1 = Dolby C Off 0 = Dolby C On
13	Dolby B	O	1 = Dolby B Off 0 = Dolby B On
14	High Speed	O	0 = Normal speed 1 = High speed
15	Record Mute	O	1 = Record mute On
16	Play / Record	O	0 = Play 1 = Record
17	Playback A/B	O	1 = Deck A 0 = Deck B
18	Normal Speed	O	0 = High speed 1 = Normal speed
19	Playback Fe/CrO2	O	0 = Ferro 1 = CrO2
20	GND	-	Ground
21	Solenoid Deck A	O	Solenoid Deck A
22	Motor deck A	O	Not used
23	Dolby Record	O	0 = Record 1 = Play
24	Tape Detect Deck A	I	0 = Tape present in deck A
25	Halle IC Deck A	I	4 Pulses per rotation of winding wheel
26	Mode Deck A	I	0 = Slide up 1 = Slide down
27	Main Motor	O	Motor B
28	Solenoid Deck B	O	Solenoid Deck B
29	CrO2 Deck A	I	0 = Ferro Tape 1 = CrO2
30	Record Frontside Deck B	I	0 = Record enabled on frontside
31	Hall IC Deck B	I	4 Pulses per rotation of winding wheel
32	Tape Detect Deck B	I	0 = Tape present in deck B
33	Mode Deck B	I	0 = Slide up 1 = Slide down
34	CrO2 Deck B	I	0 = Ferro Tape 1 = CrO2
35	TCMP	O	400 Hz oscillator
36	Record Rearside Deck B	I	0 = Record enable on rearside
37	TCAP	I	Not used
38	OSC 1	-	4 MHz
39	OSC 2	-	4 MHz
40	VCC	-	+5V

ETF3 CONTROL PART (DOLBY B & NON-DOLBY)


TAPE DECK CWA 424 - RR
MECHANISM A PB-DECK
MECHANISM B R/P-DECK
SOL A DRIVE
SOL B DRIVE
MOTOR B DRIVE
7793 MC68HC05C4P µ-CONTROLLER
* Not for non-dolby version
V PLAYBACK MODE + NORMAL SPEED
3104 217 03490 bl 130 - 02 - ETF3 DOLBY B
LEU0032 9402

ETF3 DOLBY B (for all versions except /21)

0071	F6	2657	D8	2685	D10	2713	I8	2744	G8	2768	E11	3658	E7	3694	B11	3714	H7	3743	B10	3773	F10	3798	F2	3825	D5	3861	G6	7651	E8	7782	C2	9709	C9	9734	C8
0072	E6	2658	E8	2686	C9	2714	H8	2745	F8	2782	F4	3659	D7	3695	B10	3715	I7	3744	G8	3774	C11	3799	F2	3826	E5	3864	E6	7652	B9	7783	H3	9710	C9	9736	D8
0073	F5	2659	D8	2687	D9	2715	I8	2746	C10	2787	E4	3660	F7	3696	B11	3720	H8	3745	G7	3780	C3	3600	E2	3827	F3	3865	C7	7653	D9	7784	B3	9711	C9	9737	E9
0074	F5	2660	E7	2688	C9	2716	G10	2747	C10	2791	D4	3661	D7	3697	C10	3721	I7	3746	F7	3781	B3	3801	E3	3828	G3	5650	B8	7654	B11	7785	B2	9712	D9	9740	G8
1700	H11	2661	D8	2690	F8	2717	H8	2748	C10	2796	G3	3662	C8	3698	G7	3722	G10	3747	F7	3782	C4	3602	E2	3829	G5	5651	B7	7655	B10	7786	B4	9715	D7	9780	H4
1701	H10	2668	F9	2692	B9	2718	H8	2749	B9	2797	G4	3663	C7	3699	E8	3723	H8	3748	E9	3783	B4	3803	E2	3830	G5	5652	H6	7656	G6	7787	G3	9716	D7	9782	B3
1702	F11	2669	D9	2693	C8	2730	G11	2750	G8	2799	D4	3664	B7	3700	I10	3724	H9	3749	F7	3784	B4	3804	E2	3831	F4	5653	I8	7657	H6	7791	I5	9717	D6	9783	C4
1703	G12	2672	D8	2700	H11	2731	F11	2751	G8	2800	D4	3665	B7	3701	I10	3730	G11	3760	G11	3785	H3	3805	D3	3833	F4	5730	G11	7700	I10	7792	C4	9718	D8	9784	C3
1704	B6	2673	E9	2701	I11	2732	G11	2752	F8	2808	G10	3666	B6	3702	H9	3731	F10	3761	H11	3786	B3	3806	F3	3836	E4	5731	F11	7701	G10	7793	E4	9719	C9	9786	G3
1705	I4	2674	D6	2702	H11	2733	F11	2753	F7	2810	G6	3667	B7	3703	I9	3732	G10	3762	G11	3787	B2	3807	F3	3837	F2	5760	E11	7702	H9	8700	G6	9720	C8	9787	H5
1706	D3	2675	H6	2703	H9	2734	G10	2754	F7	2811	G6	3673	E8	3704	H9	3733	F10	3763	G11	3788	H3	3808	E3	3839	C4	5760	D3	7703	H7	8701	F6	9721	C7	9789	H5
1707	D5	2676	H6	2704	I11	2735	F10	2755	E8	3501	E6	3674	E9	3705	I9	3734	C9	3764	E12	3789	B3	3809	E3	3840	H5	5790	D4	7730	F8	8702	F6	9722	G10	9790	G5
1711	C4	2677	I7	2705	I11	2736	G10	2756	F8	3650	D7	3675	E8	3706	H8	3735	C9	3765	D11	3790	B2	3810	E3	3841	B4	6650	G6	7760	D11	9700	I11	9723	F10	9791	G4
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2651	C7	2679	I8	2707	I9	2738	F9	2760	G11	3652	E6	3679	D9	3708	H7	3737	D10	3767	C11	3792	F3	3812	E3	3844	E5	6780	I3	7762	C12	9703	G8	9727	F7	9799	G6
2652	C8	2680	H8	2708	H8	2739	F10	2761	F11	3653	C6	3680	B8	3709	I7	3738	B11	3768	D11	3793	F3	3813	E3	3856	G3	6781	D2	7763	D11	9704	G8	9728	G7		
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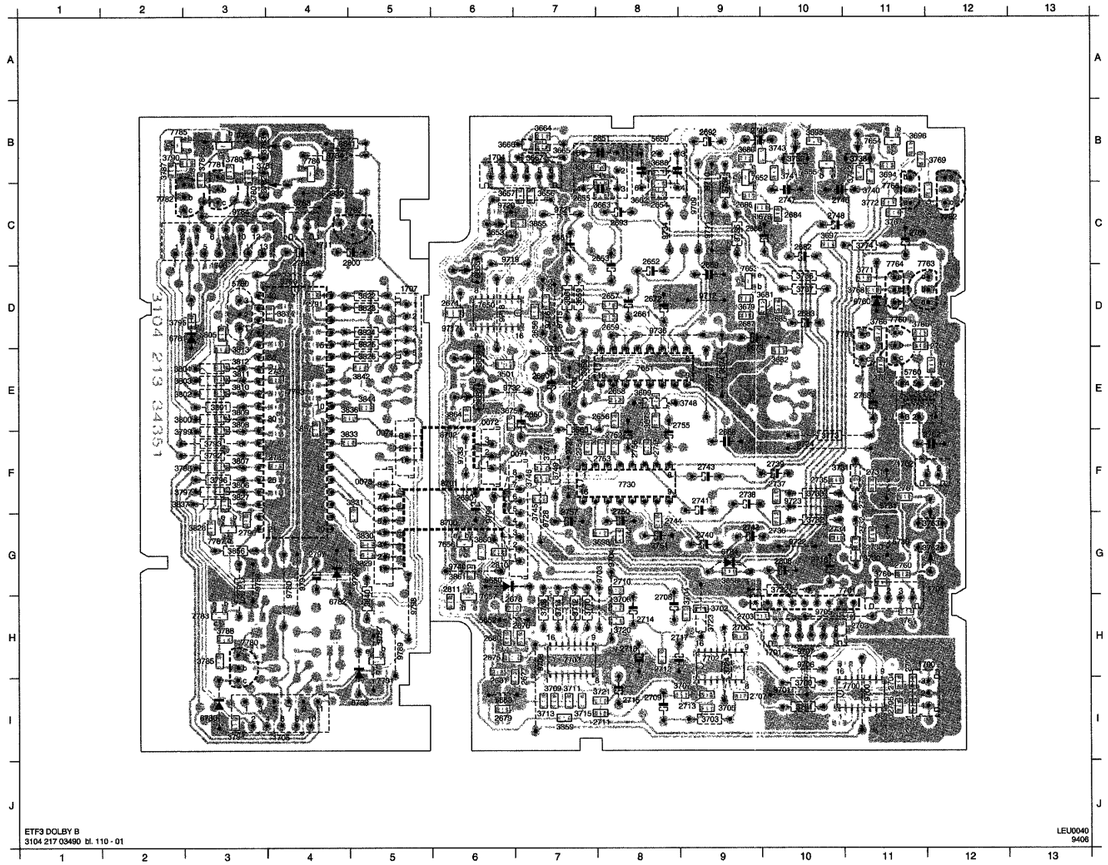
2654	C8	2682	C10	2710	G8	2741	F9	2764	E12	3655	D6	3682	E10	3711	I7	3740	C11	3770	C12	3795	D2	3822	D5	3858	G9	6783	I5	7765	C11	9706	H10	9731	E7		
2655	C7	2683	D10	2711	I7	2742	G9	2765	E11	3656	C7	3686	B8	3712	H7	3741	B10	3771	D11	3796	F3	3823	D5	3859	I7	6784	G9	7780	H3	9707	H10	9732	E6		
2656	E7	2684	C10	2712	H8	2743	F9	2766	C11	3657	C6	3689	B7	3713	I7	3742	C11	3772	C11	3797	F2	3824	D5	3860	G6	7650	D6	7781	B3	9708	H7	9733	F6		



ETF3 NON-DOLBY (For /21 only)

0071	F6	2679	I6	2706	H9	2735	F10	2753	F7	2900	D4	3686	E6	3711	I7	3738	B11	3768	D11	3788	B3	3807	F3	3836	E4	5780	D3	7702	H9	7792	C4	9716	D7	9742	E7
0072	E6	2680	H6	2707	I9	2736	G10	2754	F7	2908	G10	3687	C6	3712	H7	3739	B10	3767	C11	3790	B2	3808	E3	3839	C4	5790	D4	7703	H7	7793	E4	9717	D6	9743	D7
0073	F5	2681	I6	2708	H8	2737	F10	2755	E8	2810	G6	3694	B11	3713	I7	3740	C11	3768	D11	3791	H3	3809	E3	3840	H5	6650	G6	7730	F8	8700	G6	9718	D6	9744	E8
0074	F5	2682	C10	2709	I8	2738	F9	2756	F8	2911	G6	3695	B10	3714	H7	3741	B10	3769	B12	3792	F3	3810	E3	3841	B4	6760	D11	7760	D11	8701	F6	9720	C6	9745	D8
1700	H11	2683	D10	2710	G8	2739	F10	2757	G7	3656	C7	3696	B11	3715	I7	3742	C11	3770	C12	3793	F3	3811	E3	3842	E5	6780	I3	7761	D10	8702	F6	9721	C7	9780	H4
1701	H10	2684	C10	2711	I7	2740	G9	2760	G11	3657	C6	3697	C10	3720	H8	3743	B10	3771	D11	3794	I3	3812	E3	3844	E5	6781	D2	7762	C12	9700	I11	9722	G10	9782	B3
1702	F11	2685	D10	2712	H8	2741	F9	2761	F11	3664	B7	3698	G7	3721	I7	3744	G8	3772	C11	3795	D2	3813	E3	3856	G3	6782	H4	7763	D11	9701	I10	9723	F10	9783	C4
1703	G12	2686	C9	2713	I8	2742	G9	2762	F11	3665	B7	3700	I10	3722	G10	3745	G7	3773	F10	3796	F3	3814	D4	3857	F4	6783	I5	7764	D11	9703	G8	9724	F10	9784	C3
1704	B6	2687	D9	2714	H8	2743	F9	2764	E12	3666	B6	3701	I10	3723	H9	3746	F7	3774	C11	3797	F2	3822	D5	3858	G9	6784	G9	7785	C11	9704	G8	9727	F7	9786	G3
1705	I4	2688	C9	2715	I8	2744	G8	2765	E11	3667	B7	3702	H9	3724	H9	3747	F7	3780	C3	3798	F2	3823	D5	3859	I7	7650	D6	7780	H3	9705	H10	9725	I7	9787	H5
1706	D3	2692	B9	2716	G10	2745	F8	2766	C11	3675	E6	3703	I9	3730	G11	3748	E8	3781	B3	3799	F2	3824	D5	3860	G6	7652	B9	7781	B3	9706	H10	9731	E7	9789	H5
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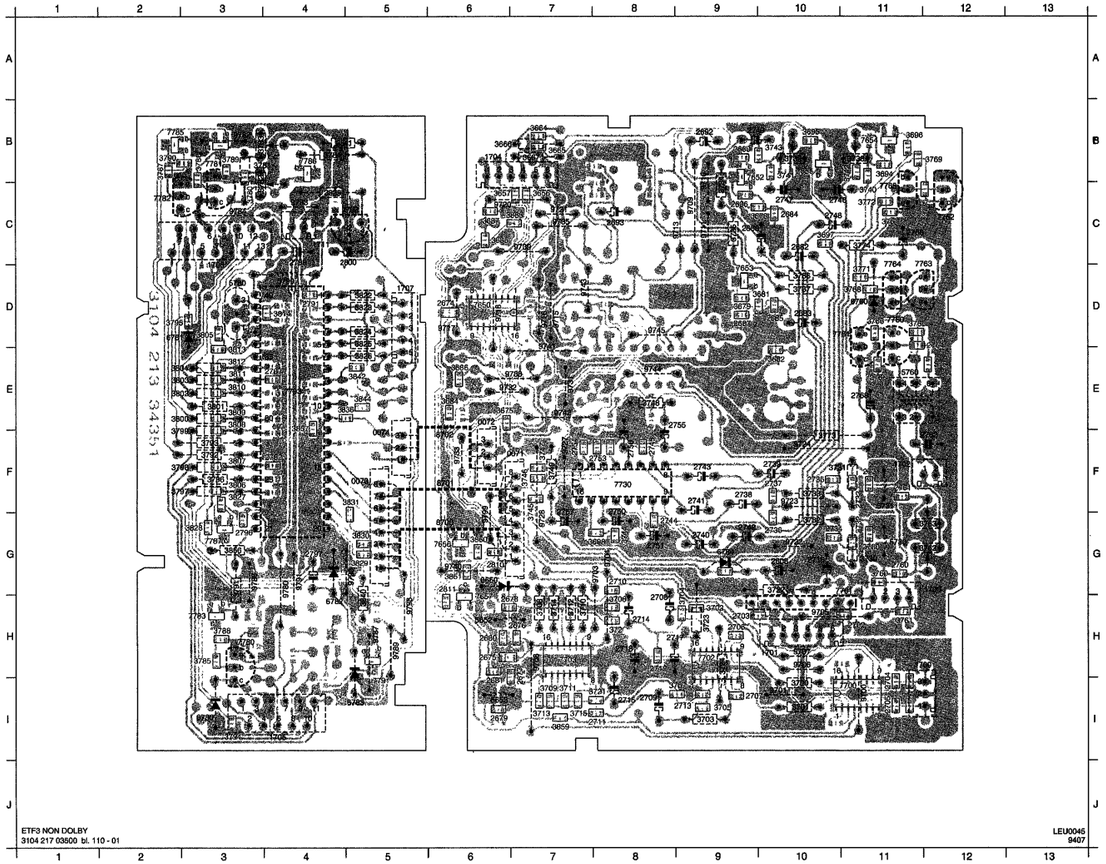
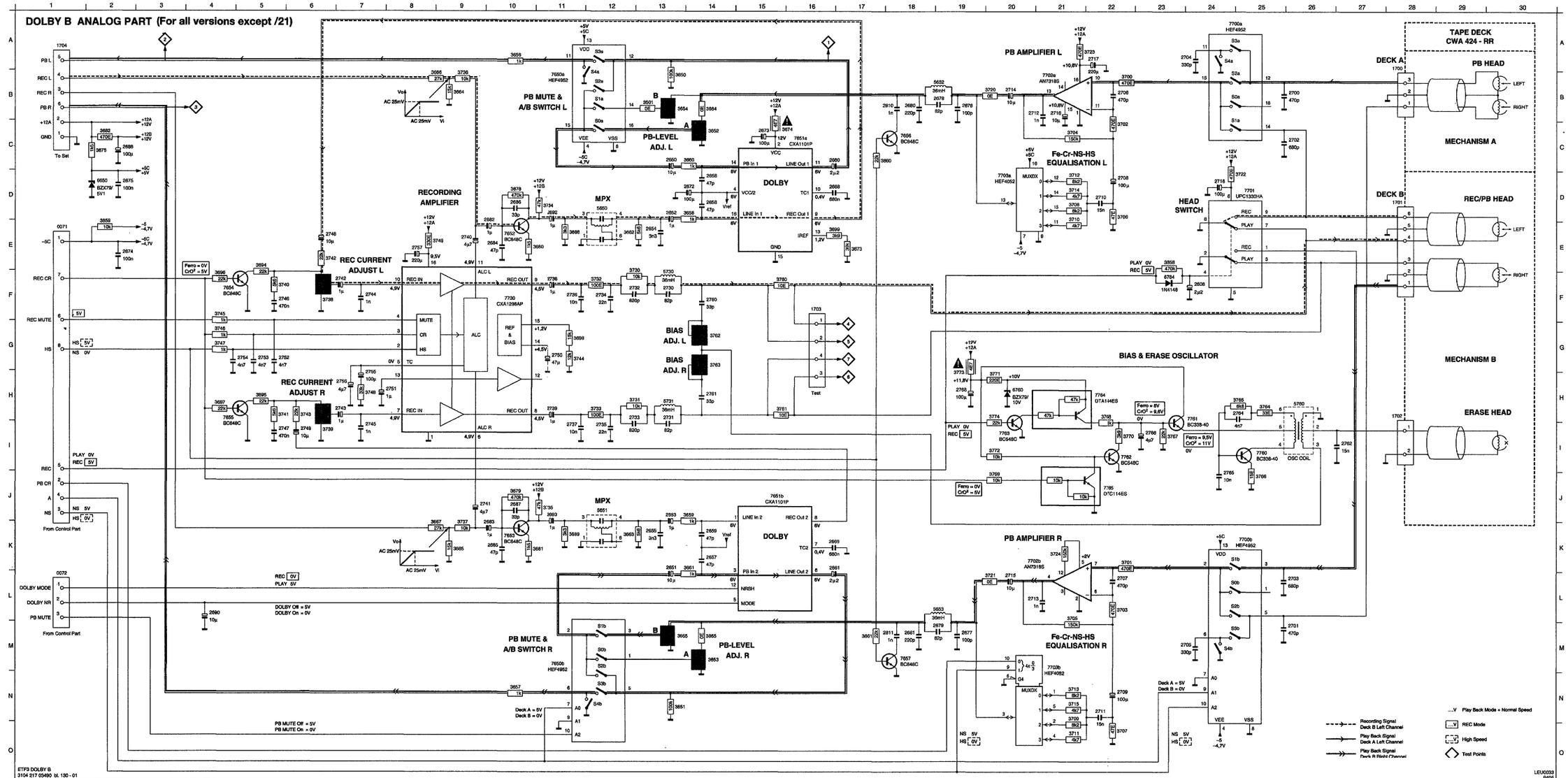
1711	C4	2700	H11	2718	H8	2747	C10	2782	F4	3679	D9	3705	I9	3732	G10	3760	G11	3783	B4	3801	E3	3826	E5	3865	C6	7654	B11	7783	H3	9708	H7	9733	F6	9791	G4
2674	D6	2701	I11	2730	G11	2748	C10	2787	E4	3680	B9	3706	H8	3733	F10	3761	H11	3784	B4	3802	E2	3827	F3	5652	H6	7655	B10	7784	B3	9709	C9	9735	C7	9798	H5
2675	H6	2702	H11	2731	F11	2749	B9	2791	D4	3681	D9	3707	I8	3734	C9	3762	G11	3785	H3	3803	E2	3828	G3	5653	I6	7656	G6	7785	B2	9710	C9	9738	E6	9799	G6
2676	H6	2703	H9	2732	G11	2750	G8	2796	G3	3682	E10	3708	H7	3735	C9	3763	G11	3786	B3	3804	E2	3829	G5	5730	G11	7657	H6	7786	B4	9711	C9	9739	C7		
2677	I7	2704	I11	2733	F11	2751	G8	2797	G4	3684	E6	3709	I7	3736	D10	3764	E12	3787	B2	3805	D3	3830	G5	5731	F11	7700	I10	7787	G3	9713	C9	9740	G6		
2678	H6	2705	I11	2734	G10	2752	F8	2799	D4	3685	C6	3710	H7	3737	D10	3765	D11	3788	H3	3806	F3	3831	F4	5760	E11	7701	G10	7791	I5	9715	D7	9741	E7		





0071 E1 3681 K10
0072 L1 3682 C2
1700 A28 3686 E11
1701 D28 3689 K11
1702 H28 3694 E5
1703 F16 3695 H5
1704 A1 3696 F4
2650 C13 3697 H4
2651 K13 3698 G11
2652 D13 3699 E16
2653 J13 3700 B22
2654 E13 3701 K22
2655 K13 3702 C22
2656 D14 3703 L22
2657 K14 3704 C21
2658 D14 3705 L21
2659 K14 3706 D22
2660 C16 3707 C22
2661 K16 3708 D21
2668 D16 3709 N21
2669 K16 3710 D21
2672 D13 3711 C21
2673 C15 3712 D21
2674 E2 3713 N21
2675 D2 3714 D21
2676 B10 3715 N21
2677 M19 3720 B19
2678 B18 3721 L19
2679 M18 3723 D25
2680 B18 3725 A21
2681 M16 3724 K21
2682 E9 3732 F12
2683 K9 3731 H12
2684 E10 3732 F12
2685 K10 3733 H12
2686 D10 3734 D11
2687 J10 3735 J11
2688 C2 3736 B9
2690 L4 3737 K9
2692 D11 3738 F8
2693 J11 3739 I6
2700 B26 3740 F5
2701 M26 3741 H5
2702 C26 3742 E6
2703 L26 3743 H6
2704 A23 3744 G11
2705 M23 3745 F4
2706 B22 3746 G4
2707 L22 3747 G4
2708 D22 3748 H7
2709 N22 3749 E8
2710 D22 3760 F15
2711 N22 3761 H15
2712 B20 3762 G14
2713 L20 3763 G14
2714 B20 3764 H25
2715 L20 3765 H24
2716 D24 3766 J25
2717 A22 3767 I23
2718 B21 3768 H22
2730 F13 3769 J20
2731 H13 3770 I22
2732 F12 3771 H20
2733 H13 3772 I20
2734 F12 3773 H19
2735 I12 3774 H20
2736 F11 3856 E23
2737 I11 3859 E2
2738 F11 3900 C17
2739 H11 3901 M17
2740 E9 3864 B14
2741 J9 3665 M14
2742 F6 5650 D12
2743 H6 5651 J12
2744 F7 5652 B18
2745 I7 5653 L18
2746 F5 5730 F13
2747 I5 5731 H13
2748 E6 5760 H26
2748 I6 6650 D2
2750 G11 6760 H20
2751 H8 6784 F23
2752 G6 7650a B11
2753 G5 7650b M11
2754 G5 7651a C16
2755 H7 7651b J15
2756 H7 7652 E10
2757 G8 7653 K10
2760 P14 7654 F4
2761 H14 7655 H4
2762 I27 7656 C18
2764 H24 7657 M18
2765 J24 7700a A24
2766 I25 7700b K25
2768 H19 7701 D25
2806 F24 7702a B21
2810 B17 7702b K20
2811 M17 7703a D20
3501 B13 7703b M21
3650 B13 7730 F10
3651 N13 7760 I25
3652 C14 7761 H24
3653 M14 7762 I22
3654 B13 7763 I20
3655 M13 7764 H22
3656 A10 7765 J22
3657 N10 S0a B24
3658 D13 S0b L24
3659 J13 S1a C24
3660 C13 S1b K24
3661 K13 S2a B24
3662 E12 S2b L24
3663 K12 S3a A24
3664 B9 S3b M24
3665 K9 S4a A24
3666 B8 S4b M24
3667 K8
3673 E17
3674 C19
3675 C2
3678 D10
3679 J10
3680 E10

EXPLANATION OF ABBREVIATIONS

A	Deck A or B
CRO2	Chrome
Dolby NR	Dolby Noise Reduction
Dolby Mode	Dolby Mode (Rec or Play)
DSA STR	DSA Strobe
DSA DA	DSA Data
DSA ACK	DSA Acknowledge
EOT A	End of Tape A
EOT B	End of Tape B
FE	Ferro
HS	High Speed
MODE A	Slide Deck A Up / Down
MODE B	Slide Deck B Up / Down
NC	Not Connect
NS	Normal Speed
PB CR	Playback Chrome
PB mute	Playback mute
PB Lever ADJ L	Playback Lever Adjustment Left
PB CR	Playback Chrome
PB mute	Playback mute
PB Lever ADJ R	Playback Lever Adjustment Right
PBL	Playback Left
PBR	Playback Right
Rec Mute	Recording Mute
Rec R	Recording Right
Rec L	Recording Left
Rec CR	Recording Chrome
REC RVS	Recording Reverse
REC	Recording
REC FWD	Recording Forward
SOL A	Solenoid A
SOL B	Solenoid B
VCC B	VCC Motor B

SERVICE SOLUTION for RIF INTERFERENCE

Re-adjust oscillator coil 5760 (half a turn)
so that the interference is gone.

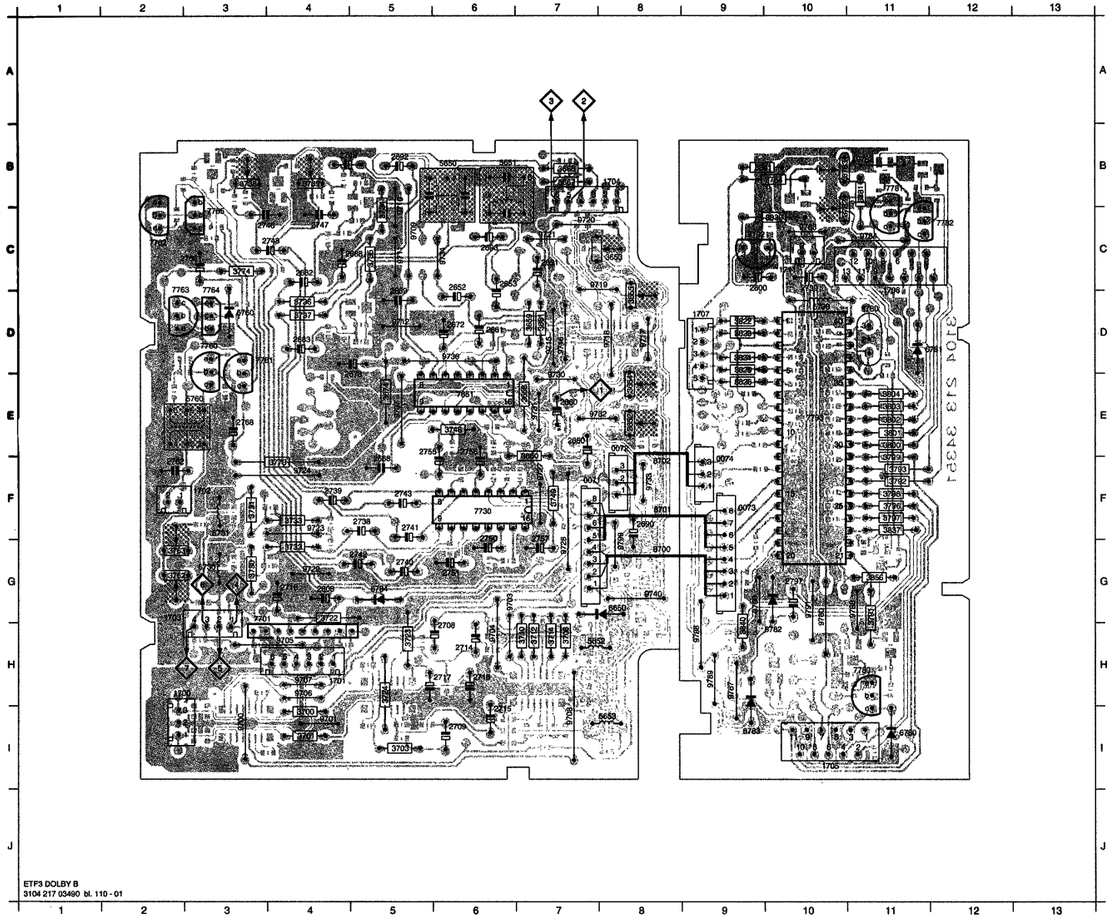
ELECTRICAL MEASUREMENTS AND ADJUSTMENTS

Adjustment	Cassette	Recorder in position	Measure on	Read on	Adjust with	Value	Remarks
Deck A High Speed HS	SBC419 3150Hz	High Speed dubbing	Test point TP **1**	Counter	3782	5,4kHz ±0,5%	see #1
Deck A Norm Speed NS	SBC419 3150Hz	Play in forward direction	Test point TP **2**	Counter	3783	3,15 kHz ±0,5%	
Wow and Flutter	SBC419 3150Hz	Play in forward direction	Test point TP **2**	Wow and Flutter meter	check	< 0,4%	
Deck A Playback DolbyLevel	Dolby 200 N Wb/m	Play in forward direction	TP **2** left ch TP **3** right ch	AC mV meter	3652 3653	548mV ±0,5dB	see #2
Deck B Playback DolbyLevel	Dolby 200 N Wb/m	Play in forward direction	TP **2** left ch TP **3** right ch	AC mV meter	3654 3655	548mV ±0,5dB	
Deck A Azimuth	SBC 419 12kHz	Play in forward direction Play in reverce direction	TP **2** left ch or TP **3** right ch	AC mV meter	Left screw Norm Dir (>) Right screw Rev Dir (<)	max output left=right	
Deck B Azimuth	SBC 419 12kHz	Play in forward direction Play in reverce direction	TP **2** left ch or TP **3** right ch	AC mV meter	Left screw Norm Dir (>) Right screw Rev Dir (<)	max output left=right	
Bias current Chrome	-	Record mode and Chrome mode	TP **4** **5** L ch TP **6** **7** R ch	AC mV meter	3762 3763	7 mV	see #3
Bias current Ferro	-	Record mode and Ferro mode	TP **4** **5** L ch TP **6** **7** R ch	AC mV meter	check check	4,4mV ±0,5dB	
Recording current	Dolby 200N Wb/m (deck A) and Chrome cass (deck B)	Record mode and Chrome mode	TP **4** **5** L ch TP **6** **7** R ch	AC mV meter	3738 3739	0,68mV Rec/PB Level within ±1 dB of 548 mV	Filter out osc with audio filter see also #4
	Dolby 200N Wb/m (deck A) and Ferro cass (deck B)	Record mode and Ferro mode	TP **4** **5** L ch TP **6** **7** R ch		check check	0,45mV Rec/PB Level within ±1 dB of 548 mV	
Multiplex Filter		Record mode Inject 19kHz at line in	TP **2** left ch TP **3** right ch	AC mV meter	5650 5651	Min output Typ Attenuation >40dB Min Attenuation >30dB	
Oscillator Frequency		Record mode	TP **4** **5** L ch	Counter	5760	88kHz ±6kHz	

#1 Motor must be aligned for HS before NS H.S ratio = 1,7
#2 Dolby level to be tested in reverse direction within same tolerance
#3 Bias current must be aligned for Chrome position
#4 Recording current should be aligned using an iterative method Perform a dubbing using test tape Dolby 200 N Wb/m as source, and Ferro tape or Chrome tape as target blank tapes Check that the output t p gives 548 mV during dubbing Then playback the recorded tape The record/playback level should also be 548 mV ± 0 5 dB If not, adjust 3738 (L) and 3739 (R) accordingly

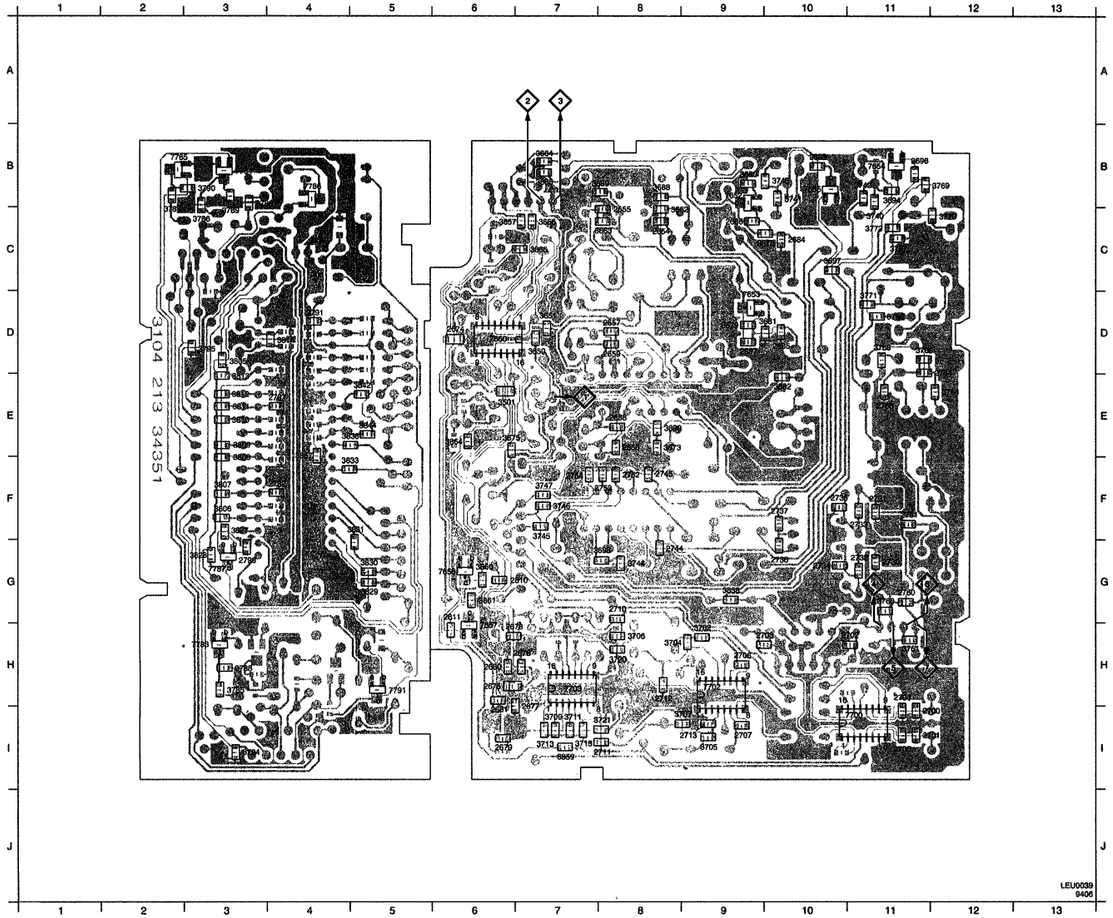
ETF3 DOLBY B - COMPONENTS

0071	F7	1707	D9	2673	E4	2716	G4	2748	C3	2799	D10	3686	B7	3723	H5	3739	B4	3791	H11	3804	E11	5650	B6	6780	I11	7763	D2	9700	J3	9712	D5	9727	F7	9782	B11
0072	E8	1711	C10	2682	C4	2717	H6	2749	B4	2800	D9	3687	B7	3724	H5	3748	E6	3792	F11	3822	D9	5651	B6	6781	D11	7764	D3	9701	I4	9715	D7	9728	G7	9783	C10
0073	F9	2650	E7	2683	D4	2718	H5	2750	G6	2808	G4	3674	E5	3730	G3	3749	F7	3793	F11	3823	D9	5652	H7	6782	H9	7765	C3	9703	G6	9716	D7	9730	E7	9784	C11
0074	F9	2651	C7	2688	C4	2738	F5	2751	G6	3652	E8	3700	I4	3731	F3	3762	G2	3796	F11	3824	D9	5653	I7	6783	I9	7780	H11	9704	H6	9717	D8	9731	E7	9786	G11
1700	H2	2652	C6	2690	F8	2739	F4	2755	E5	3653	C8	3701	I4	3732	G4	3763	G2	3797	F11	3825	D9	5730	G3	6784	G5	7781	B11	9705	H4	9718	D8	9732	E7	9787	H9
1701	H4	2653	C6	2692	B5	2740	G5	2756	E6	3654	E8	3703	I5	3733	F4	3773	F4	3798	F11	3826	E9	5731	F3	7651	E5	7782	C12	9706	H4	9719	C7	9733	F8	9789	H9
1702	F3	2660	E7	2693	C8	2741	F5	2757	G7	3655	D8	3708	H7	3734	C5	3774	C3	3799	F11	3837	F11	5760	E3	7701	G3	7792	C9	9707	H4	9720	C7	9734	C6	9790	G9
1703	G2	2661	D8	2708	H6	2742	G4	2762	F2	3656	E7	3710	H7	3735	C5	3781	B11	3800	E11	3839	C10	5760	D11	7730	F6	7793	E10	9708	I7	9721	C7	9736	D6	9791	G10
1704	B8	2668	F5	2709	I6	2743	F5	2766	C2	3659	D7	3712	H7	3736	D4	3782	C11	3801	E11	3840	H9	5790	D10	7760	D3	8700	G8	9709	C5	9722	G4	9737	E5	9798	H9
1705	I10	2669	D5	2714	H6	2746	C3	2768	E3	3660	F7	3714	H7	3737	D4	3783	B11	3802	E11	3841	B9	6650	G8	7761	D3	8701	F8	9710	C5	9723	F4	9740	G8	9799	G8
1706	D11	2672	D8	2715	I6	2747	C4	2797	G10	3661	D7	3722	G4	3738	B3	3784	B10	3803	E11	3856	G11	6760	D3	7762	C2	8702	F8	9711	C5	9724	F4	9780	H10		

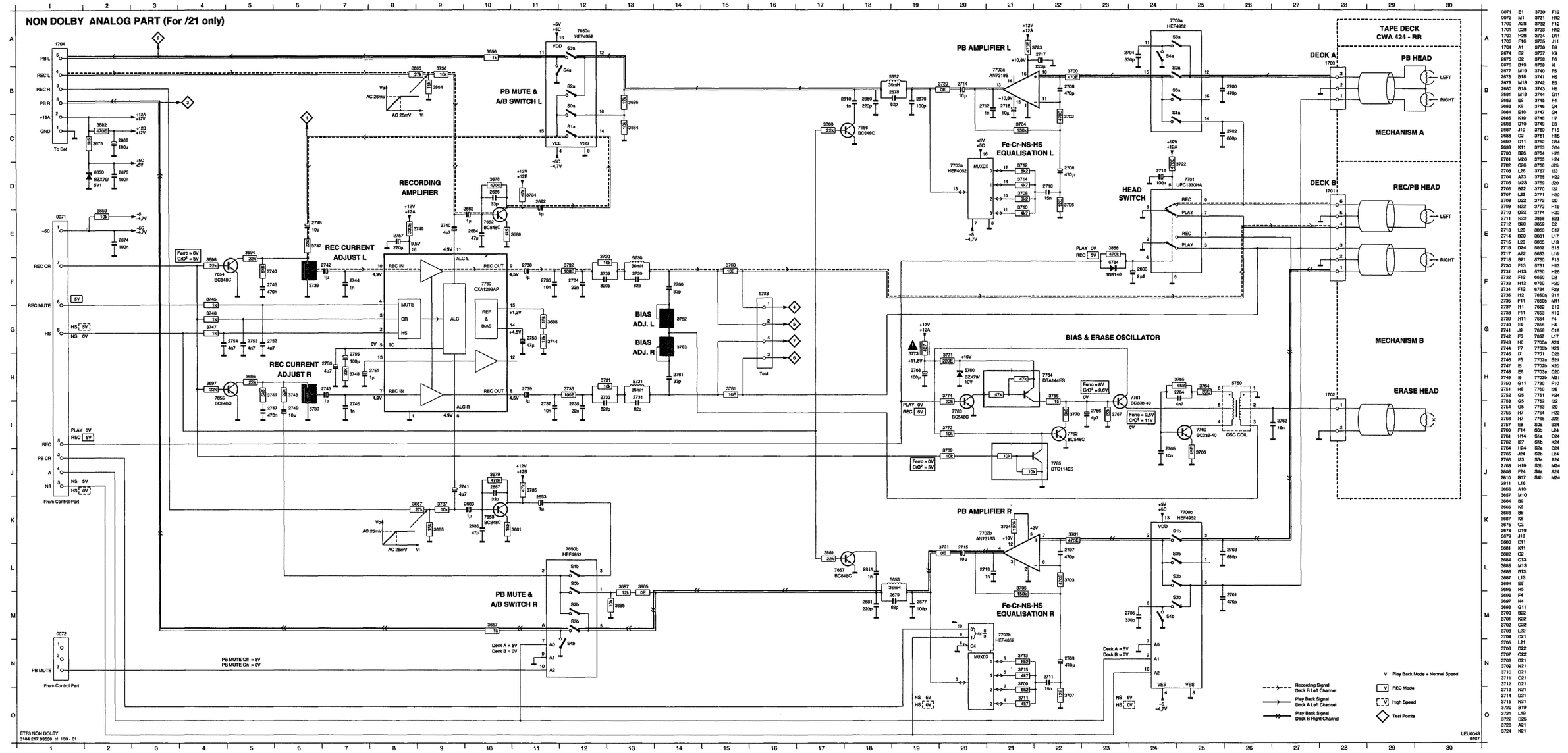


ETF3 DOLBY B - CHIPS

2654	C8	2677	I7	2700	I11	2711	I7	2736	G10	2764	E12	3650	D7	3675	E6	3685	B10	3707	I8	3742	B11'	3765	D11	3785	H3	3806	F3	3827	F3	3857	F4	7653	D9	7784	B3
2655	C8	2678	H8	2701	I11	2712	H8	2737	F10	2765	E11	3651	D7	3678	C9	3696	B11	3709	I7	3743	B10	3766	D11	3786	C3	3807	F3	3828	G3	3858	G9	7654	B11	7785	B2
2656	E8	2679	I8	2702	H10	2713	I8	2744	G8	2782	F4	3656	C7	3679	D9	3697	C10	3711	I7	3744	G8	3767	C11	3787	C2	3808	F3	3829	G5	3859	I7	7655	B10	7786	B4
2657	D8	2680	H8	2703	H9	2730	G11	2745	F8	2787	E4	3657	C6	3680	B9	3698	G7	3713	I7	3745	F7	3768	D11	3788	H3	3809	E3	3830	G5	3860	G8	7656	G8	7787	G3
2658	E8	2681	I8	2704	H11	2731	F11	2752	F8	2791	D4	3662	C8	3681	D9	3699	E8	3715	I7	3746	F7	3769	B12	3789	C3	3810	E3	3831	F4	3861	G6	7657	H8	7791	H5
2659	D8	2684	C10	2705	I11	2732	G11	2753	F7	2796	G3	3663	C7	3682	E10	3702	H9	3720	H8	3747	F7	3770	C12	3790	B3	3811	E3	3833	F4	3864	E6	7700	I10		
2674	D6	2685	D10	2706	H9	2733	F11	2754	F7	2810	G6	3664	B7	3688	B8	3704	H8	3721	I7	3760	G11	3771	D11	3794	I3	3812	E3	3836	E4	3865	C7	7702	H9		
2675	H6	2686	C9	2707	I9	2734	G10	2760	G11	2811	G6	3665	B7	3689	B7	3705	I9	3740	C11	3761	H11	3772	C11	3795	D3	3813	E3	3842	E5	7650	D6	7703	H7		
2676	H6	2687	D9	2710	G8	2735	F10	2761	F11	3501	E6	3673	E8	3694	B11	3706	H8	3741	B10	3764	E12	3780	B3	3805	D3	3814	D4	3844	E5	7652	B9	7783	H3		



NON DOLBY ANALOG PART (For /21 only)



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EXPLANATION OF ABBREVIATIONS

A	Deck A or B
CRO2	Chrome
Dolby NR	Dolby Noise Reduction
Dolby Mode	Dolby Mode (Rec or Play)
DSA STR	DSA Strobe
DSA DA	DSA Data
DSA ACK	DSA Acknowledge
EOT A	End of Tape A
EOT B	End of Tape B
FE	Ferro
HS	High Speed
MODE A	Slide Deck A Up / Down
MODE B	Slide Deck B Up / Down
NC	Not Connect
NS	Normal Speed
PB CR	Playback Chrome
PB mute	Playback mute
PB Lever ADJ L	Playback Lever Adjustment Left
PB CR	Playback Chrome
PB mute	Playback mute
PB Lever ADJ R	Playback Lever Adjustment Right
PBL	Playback Left
PBR	Playback Right
Rec Mute	Recording Mute
Rec R	Recording Right
Rec L	Recording Left
Rec CR	Recording Chrome
REC RVS	Recording Reverse
REC	Recording
REC FWD	Recording Forward
SOL A	Solenoid A
SOL B	Solenoid B
VCC B	VCC Motor B

SERVICE SOLUTION for RIF INTERFERENCE

Re-adjust oscillator coil 5760 (half a turn)
so that the interference is gone.

ELECTRICAL MEASUREMENTS AND ADJUSTMENTS

Adjustment	Cassette	Recorder in position	Measure on	Read on	Adjust with	Value	Remarks
Deck A High Speed HS	SBC419 3150Hz	High Speed dubbing	Test point TP **1**	Counter	3782	5,4kHz ±0,5%	see #1
Deck A Norm Speed NS	SBC419 3150Hz	Play in forward direction	Test point TP **2**	Counter	3783	3,15 kHz ±0,5%	
Wow and Flutter	SBC419 3150Hz	Play in forward direction	Test point TP **2**	Wow and Flutter meter	check	< 0,4%	
Deck A Azimuth	SBC 419 12kHz	Play in forward direction	TP **2** left ch or TP **3** right ch	AC mV meter	Left screw Norm Dir (>)	max output left=right	
		Play in reverce direction			Right screw Rev Dir (<)		
Deck B Azimuth	SBC 419 12kHz	Play in forward direction	TP **2** left ch or TP **3** right ch	AC mV meter	Left screw Norm.Dir.(>)	max. output left=right	
		Play in reverce direction			Right screw Rev.Dir.(<)		
Bias current Chrome	-	Record mode and Chrome mode	TP **4** **5** L.ch	AC mV meter	3762	7 mV	see #2
			TP **6** **7** R.ch		3763		
Bias current Ferro	-	Record mode and Ferro mode	TP **4** **5** L ch	AC mV meter	check	4,4mV ±0,5dB	
			TP **6** **7** R ch		check		
Recording current	Dolby 200N Wb/m (deck A) and Chrome.cass (deck B)	Record mode and Chrome mode	TP **4** **5** L ch	AC mV meter	3738	0,68mV	Filter out osc with audio filter see also #3
			TP **6** **7** R ch		3739	Rec/PB Level within ±1 dB of 548 mV	
	Dolby 200N Wb/m (deck A) and Ferro.cass (deck B)	Record mode and Ferro mode	TP **4** **5** L ch		check	0,45mV	
			TP **6** **7** R ch		check	Rec/PB Level within ±1 dB of 548 mV	
Oscillator Frequency		Record mode	TP **4** **5** L.ch	Counter	5760	88kHz ±6kHz	

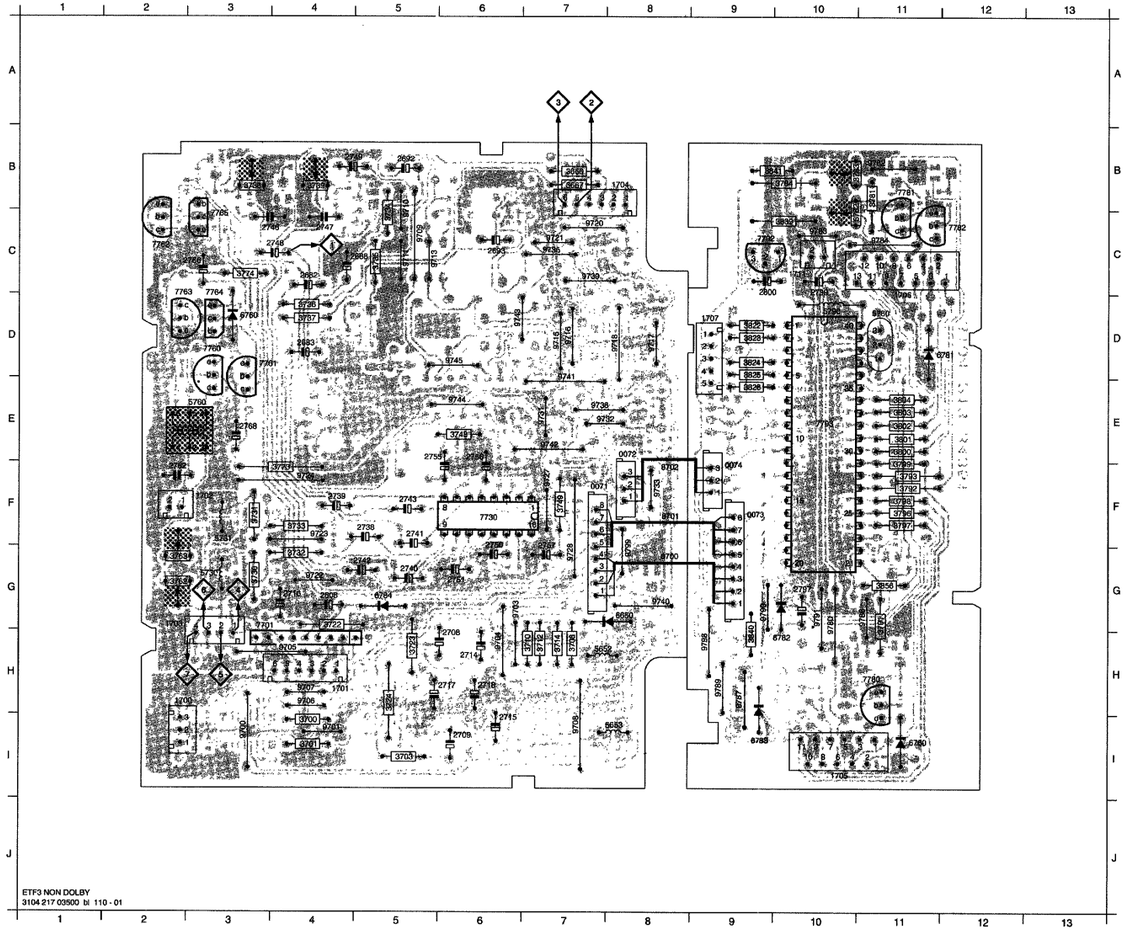
#1 Motor must be aligned for HS before NS. H.S. ratio = 1,7

#2 Bias current must be aligned for Chrome position.

#3 Recording current should be aligned using an iterative method. Perform a dubbing using test tape Dolby 200 N. Wb/m as source, and Ferro tape or Chrome tape as target blank tapes. Check that the output t.p. gives 548 mV during dubbing. Then playback the recorded tape. The record/playback level should also be 548 mV ± 0.5 dB. If not, adjust 3738 (L) and 3739 (R) accordingly.

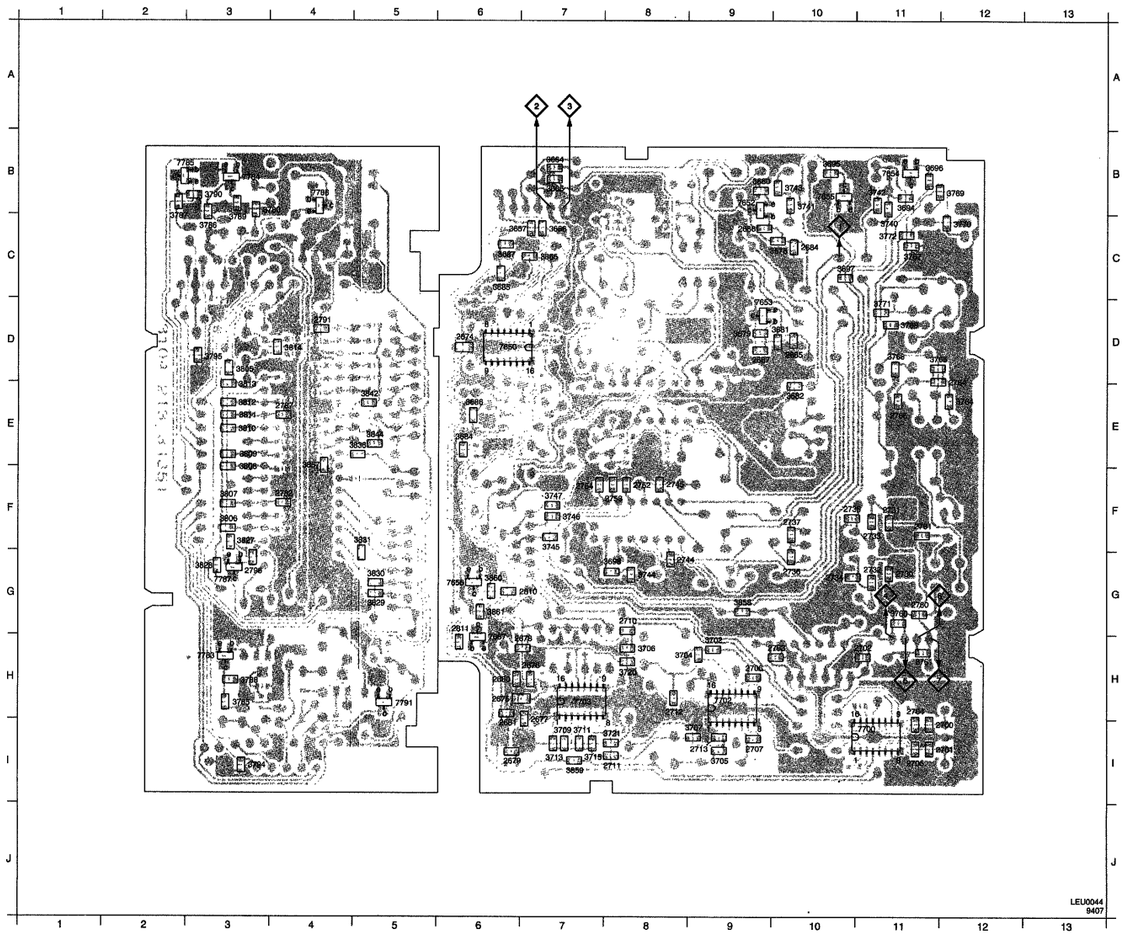
ETF3 NON-DOLBY - COMPONENTS

0071	F7	1706	D11	2714	H6	2743	F5	2762	F2	3701	I4	3731	F3	3749	F7	3792	F11	3804	E11	5652	H7	6781	D11	7764	D3	9700	I3	9711	C5	9724	F4	9741	E7	9787	H9
0072	E8	1707	D9	2715	I6	2746	C3	2766	C2	3703	I5	3732	G4	3762	G2	3793	F11	3822	D9	5653	I7	6782	H9	7765	C3	9701	I4	9713	C5	9727	F7	9742	E7	9789	H9
0073	F9	1711	C10	2716	G4	2747	C4	2768	E3	3706	H7	3733	F4	3763	G2	3796	F11	3823	D9	5730	G3	6783	I9	7780	H11	9703	G6	9715	D7	9728	G7	9743	D6	9790	G9
0074	F9	2682	C4	2717	H6	2748	C3	2797	G10	3710	H7	3734	C5	3773	F4	3797	F11	3824	D9	5731	F3	6784	G5	7781	B11	9704	H6	9716	D7	9731	E7	9744	E6	9791	G10
1700	H2	2683	D4	2718	H6	2749	B4	2799	D10	3712	H7	3735	C5	3774	C3	3798	F11	3825	D9	5760	E3	7701	G3	7782	C12	9705	H4	9717	D8	9732	E7	9745	D6	9798	H9
1701	H4	2688	C4	2736	F5	2750	G6	2800	D9	3714	H7	3736	D4	3781	B11	3799	F11	3826	E9	5780	D11	7730	F6	7792	C9	9706	H4	9718	D8	9733	F8	9780	H10	9799	G8
1702	F3	2692	B5	2739	F4	2751	G6	2808	G4	3722	G4	3737	D4	3782	C11	3800	E11	3839	C10	5790	D10	7760	D3	7793	E10	9707	H4	9720	C7	9735	C7	9782	B11		
1703	G2	2693	C6	2740	G5	2755	E5	3666	B7	3723	H5	3738	B3	3783	B11	3801	E11	3840	H9	6650	G8	7761	D3	8700	G8	9708	I7	9721	C7	9738	E7	9783	C10		
1704	B8	2708	H6	2741	F5	2756	E6	3667	B7	3724	H5	3739	B4	3784	B10	3802	E11	3841	B9	6760	D3	7762	C2	8701	F8	9709	C5	9722	G4	9739	C7	9784	C11		
1705	I10	2709	I6	2742	G4	2757	G7	3700	I4	3730	G3	3748	E6	3791	H11	3803	E11	3856	G11	6780	I11	7763	D2	8702	F8	9710	C5	9723	F4	9740	G8	9786	G11		

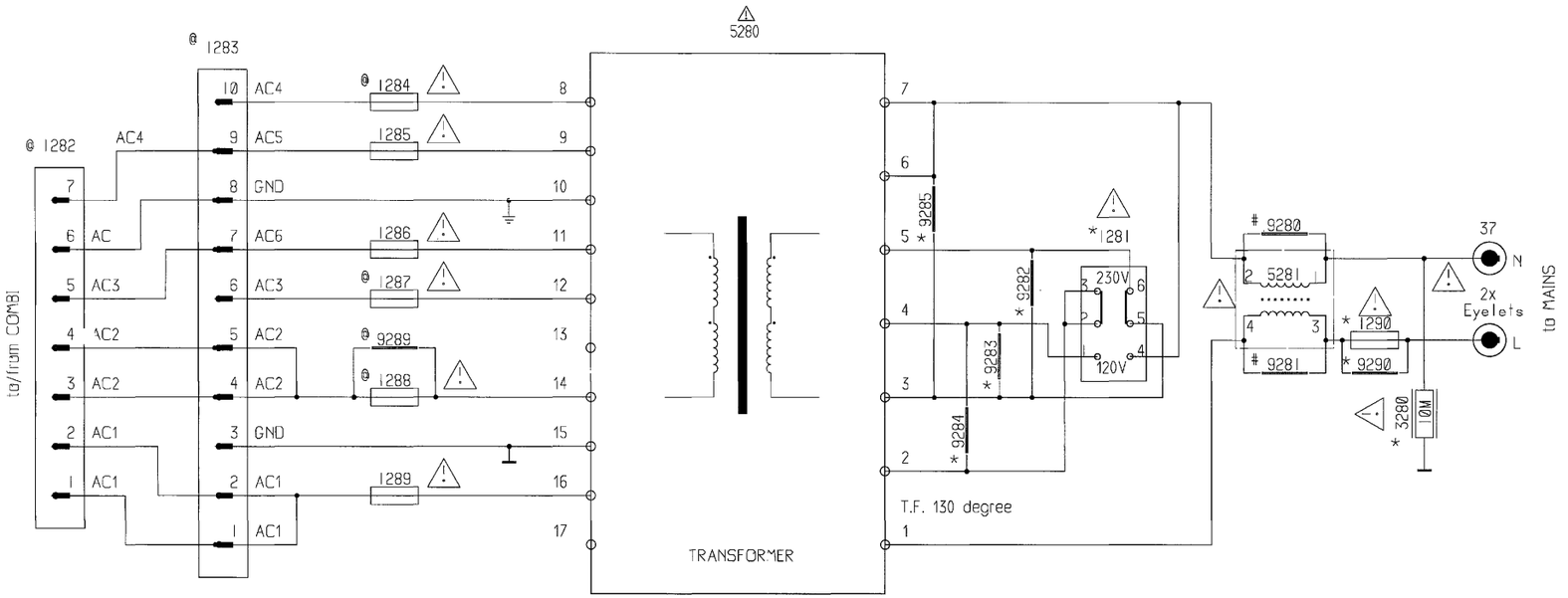


ETF3 NON-DOLBY - CHIPS

2674	D6	2684	C10	2704	H11	2730	G11	2744	G6	2765	E11	3657	C6	3684	E6	3698	G7	3713	I7	3744	G8	3766	D11	3785	H3	3805	D3	3813	E3	3842	E5	7650	D6	7702	H9
2675	H6	2685	D10	2705	I11	2731	F11	2745	F6	2782	F4	3664	B7	3685	C6	3702	H9	3715	I7	3745	F7	3767	C11	3786	C3	3806	F3	3814	D4	3844	E5	7652	B9	7703	H7
2676	H7	2686	C9	2706	H9	2732	G11	2752	F8	2787	E4	3665	B7	3686	E6	3704	H8	3720	H8	3746	F7	3768	D11	3787	C2	3807	F3	3827	F3	3857	F4	7653	D9	7785	H3
2677	I7	2687	D9	2707	I9	2733	F11	2753	F8	2791	D4	3678	C9	3687	C6	3705	I9	3721	I7	3747	F7	3769	B12	3788	H3	3808	F3	3828	G3	3858	G9	7654	B11	7784	B3
2678	H6	2700	I11	2710	G8	2734	G10	2754	F7	2796	G3	3679	D9	3694	B11	3706	H8	3740	C11	3760	G11	3770	C12	3789	C3	3809	E3	3829	G5	3859	I7	7655	B10	7785	B2
2679	I6	2701	I11	2711	I7	2735	F10	2760	G11	2810	G6	3680	B9	3695	B10	3707	I8	3741	B10	3761	H11	3771	D11	3790	B3	3810	E3	3830	G6	3860	G6	7656	G6	7786	B4
2680	H6	2702	H10	2712	H8	2736	G10	2761	F11	2811	G6	3681	D9	3696	B11	3709	I7	3742	B11	3764	E12	3772	C11	3794	I3	3811	E3	3831	F5	3861	G6	7657	H8	7787	G3
2681	I6	2703	H9	2713	I9	2737	F10	2764	E12	3656	C7	3682	E10	3697	C10	3711	I7	3743	B10	3765	D11	3780	B3	3795	D3	3812	E3	3836	E4	3865	C7	7700	I11	7791	H5



TRAFO CIRCUIT



NOT IN USE (FOR PROVISION ONLY)

Note for items marked @

ITEM \ MODEL	FW26	FW46
1282	Use	Not use
1283	Not use	Use
1284	Not use	Use
1287	Not use	Use
1288	Not use	Use
9289	Use	Not use
9282	Not use	Use*
9283	Not use	Use*

NOTE FOR ITEMS MARKED *

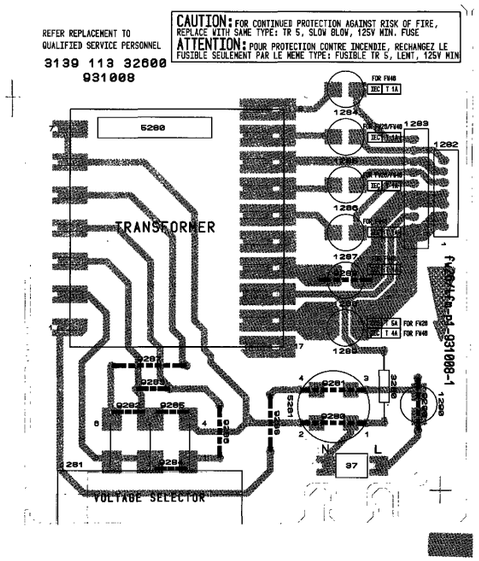
ITEM \ VOLTAGE	220-230V	110-127 / 220-240V	230-240V	120V	100V
1281	Not use	Use	Not use	Not use	Not use
9282	Use@	Not use	Not use	Not use	Not use
9283	Not use	Not use	Use@	Not use	Not use
9284	Not use	Not use	Not use	Use	Not Use
9285	Not use	Not use	Not use	Use	Not Use
3280	Not use	Not use	Not use	Use	Not Use
1290	Not use	Not use	Not use	Use	Not Use
9290	Use	Use	Use	Not Use	Use

Remark

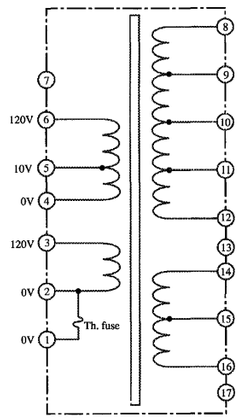
For the exact value of fuses, refer to partlist

	FW26	FW46
1284	Not use	Use
1285 1286	Use	Use
1287	Not use	Use
1288	Not use	Use
1289	Use	Use

TRAFO COMPONENT LAYOUT


REFER REPLACEMENT TO
QUALIFIED SERVICE PERSONNEL
3139 113 32600
931008
CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE WITH SAME TYPE: TR 5, SLOW BLOW, 125V MIN. FUSE
ATTENTION: POUR PROTECTION CONTRE INCENDIE, REMPLACEZ LE FUSIBLE SEULEMENT PAR LE MEME TYPE: FUSIBLE TR 5, LENT, 125V MIN
5280
TRANSFORMER
VOLTAGE SELECTOR
f-9310-pcb-931008-1

FW46 (except /26 and /37)

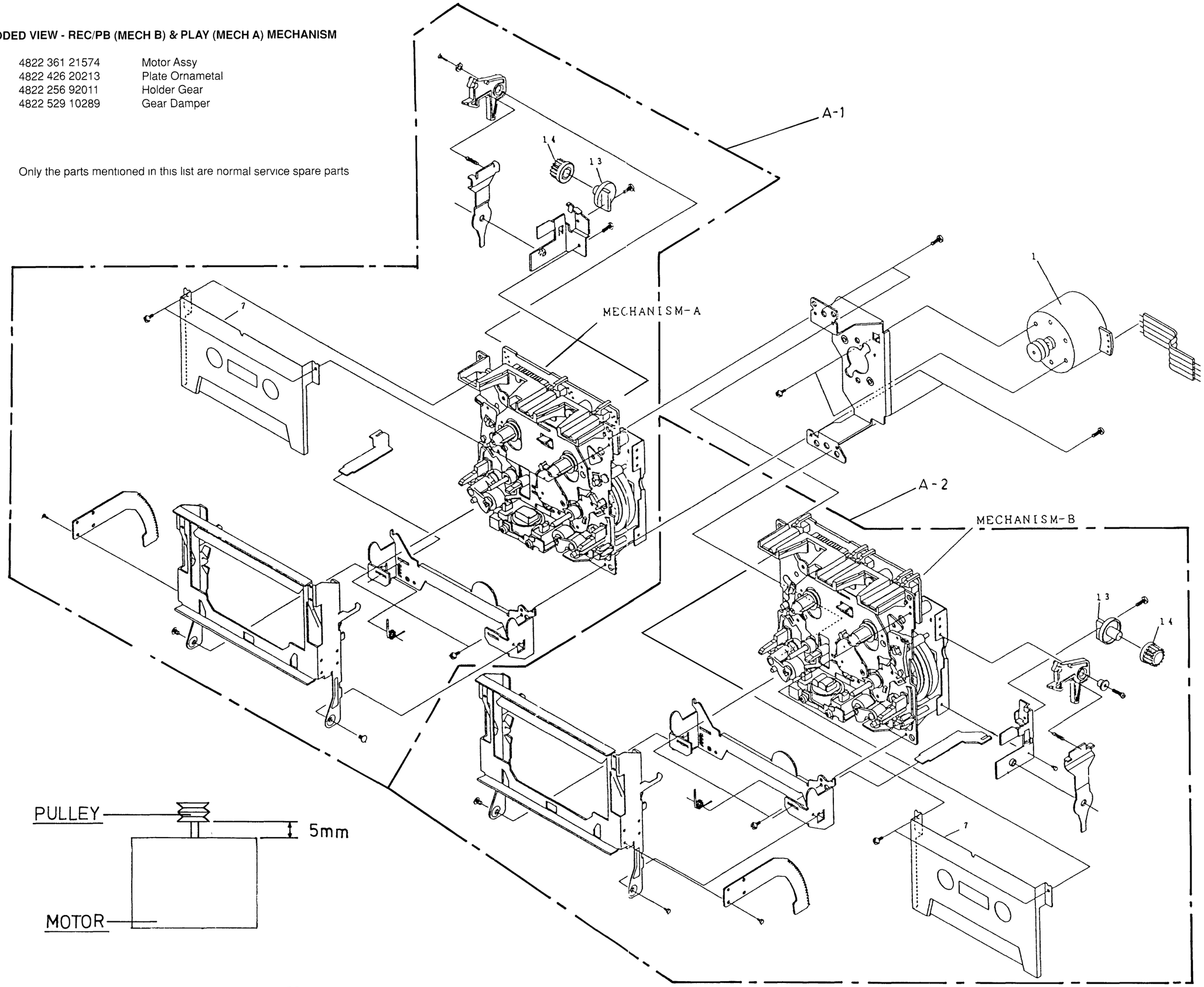


4822 146 31335

EXPLODED VIEW - REC/PB (MECH B) & PLAY (MECH A) MECHANISM

1	4822 361 21574	Motor Assy
7	4822 426 20213	Plate Ornametal
13	4822 256 92011	Holder Gear
14	4822 529 10289	Gear Damper

Note Only the parts mentioned in this list are normal service spare parts



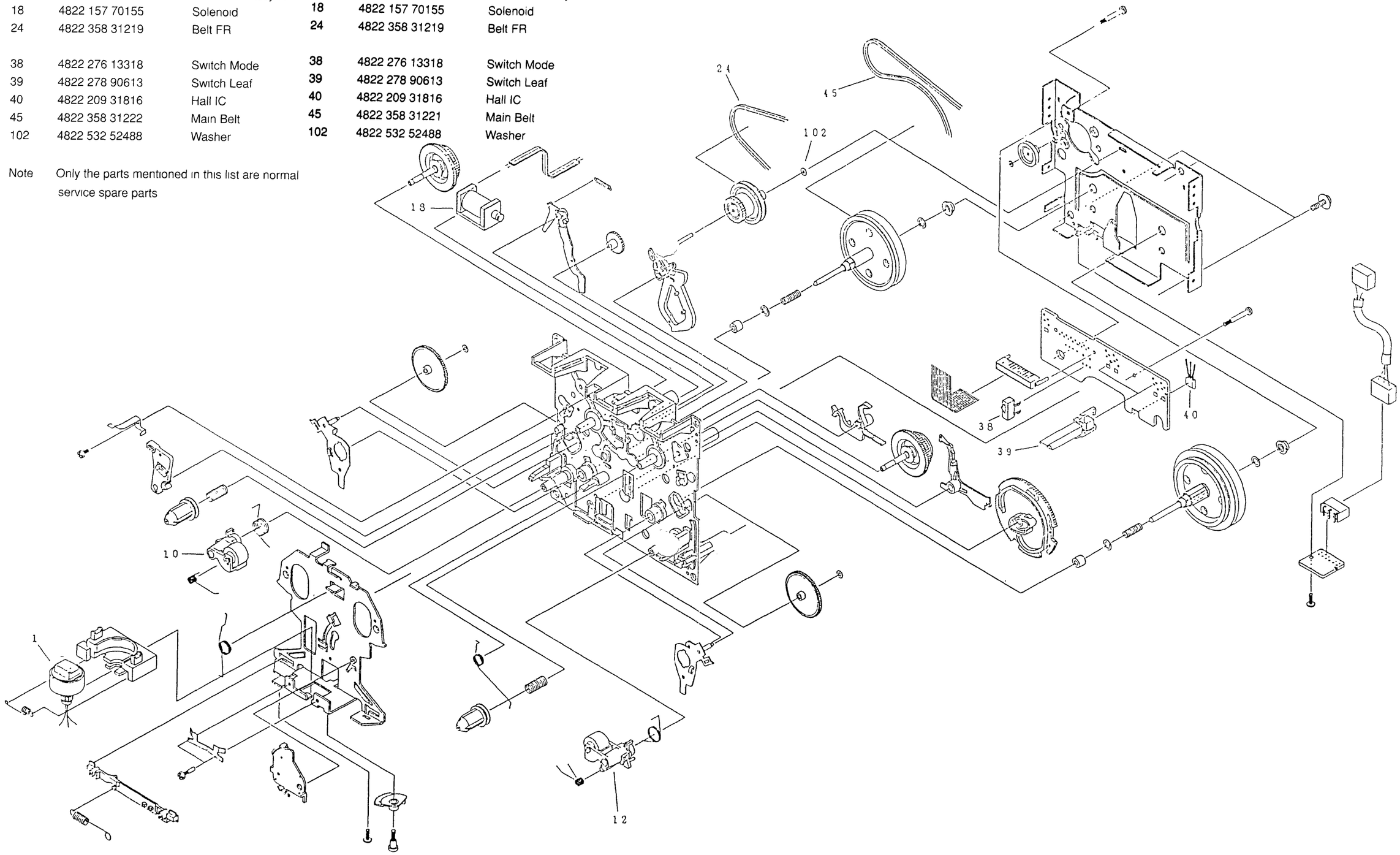
EXPLODED VIEW - PLAY (MECH A) MECHANISM

1	4822 249 30189	Play Head Assy
10	4822 403 70729	Pinch Arm Assy L
12	4822 403 70731	Pinch Arm Assy R
18	4822 157 70155	Solenoid
24	4822 358 31219	Belt FR
38	4822 276 13318	Switch Mode
39	4822 278 90613	Switch Leaf
40	4822 209 31816	Hall IC
45	4822 358 31222	Main Belt
102	4822 532 52488	Washer

Note Only the parts mentioned in this list are normal service spare parts

EXPLODED VIEW - REC/PB (MECH B) MECHANISM

1	4822 249 10472	Rec/Play Head Assy
10	4822 403 70729	Pinch Arm Assy L
12	4822 403 70731	Pinch Arm Assy R
18	4822 157 70155	Solenoid
24	4822 358 31219	Belt FR
38	4822 276 13318	Switch Mode
39	4822 278 90613	Switch Leaf
40	4822 209 31816	Hall IC
45	4822 358 31221	Main Belt
102	4822 532 52488	Washer



Procedure to replace belts/mechanisms

1. Remove the damper gear assembly (pos 13 + 14) and gear lever (pos 9).

2. Remove 4 screws (pos 5) and Playback mechanism (pos A-1) and Rec/Pb mechanism pos (A-2) can now be sepa rated.

Note: The assembly of main belt for the Rec/Pb mechanism must always be done before that of Playback mechanism.

3A. Record/Pb Mechanism A-2

i) Unscrew 4 screws (pos 85 + 86) and remove the cover bracket (pos 41).
ii) Route the belt as shown in figure 1 around the temporary pins (see arrow).
iii) Assemble the cover bracket (pos 41), care should be taken not to loosen the belt.
iv) Assemble the motor bracket assembly (pos 1 + 3) onto the Rec/Pb mechanism.
v) Use a wire with a hook end (see figure 3), transfer the belt from the temporary position onto the motor pulley (pos 1) as in figure 5 & 6.

2B. Playback Mechanism A-1

i) Place a piece of tape to hold the eject lever (pos 11) to bracket (pos 16) and remove the door catch (pos 12).
ii) Unscrew 4 screws (pos 85 + 86) and remove the cover bracket (pos 41).
iii) Route the belt as shown in figure 2 around the temporary pins (see arrow).
iv) Assemble the cover bracket (pos 41), care should be taken not to loosen the belt.
v) Assemble the Playback mechanism A-1 onto the rest of the tape mechanism.
vi) Use a wire with a hook end (see figure 3), transfer the belt from the temporary position onto the motor pulley (pos 1) and the small pulley (pos 42) on cover bracket as in figure 4 - 6.
vii) Remove the tape on the eject lever and assemble door catch (pos 12).

3. Assemble the damper gear assembly (pos 13 + 14) and gear lever (pos 9).

4. After completion, perform the tape adjustment to ensure no mis-alignment due to handling.

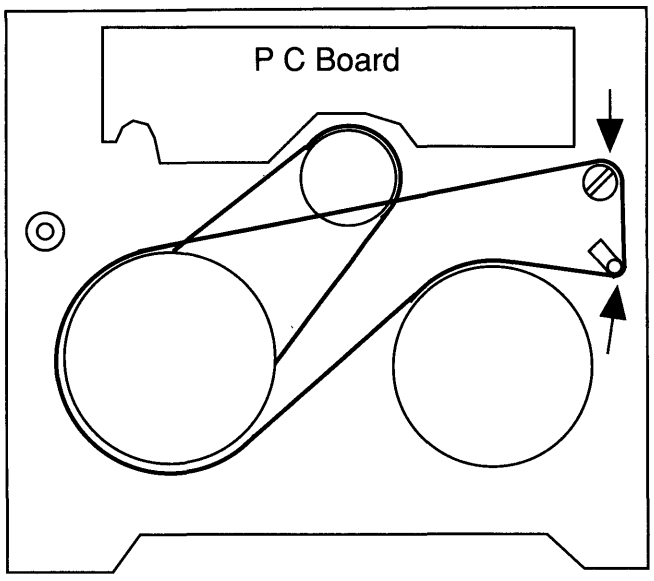


Figure 1. Rec/Pb mechanism A-2

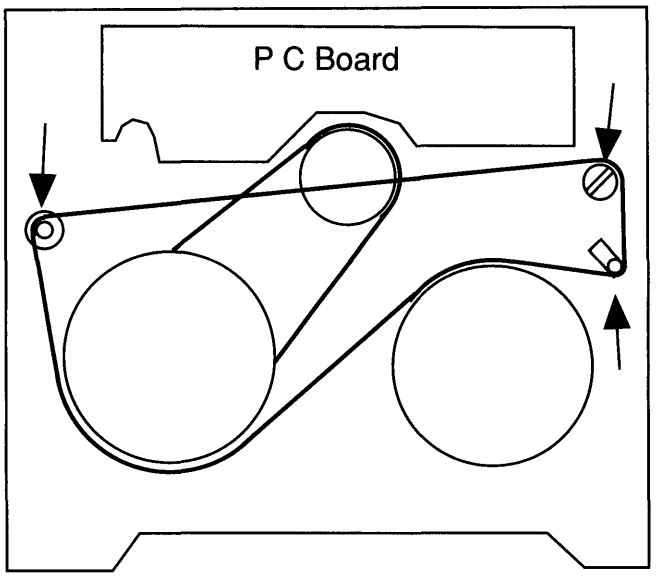


Figure 2. Play mechanism A-1

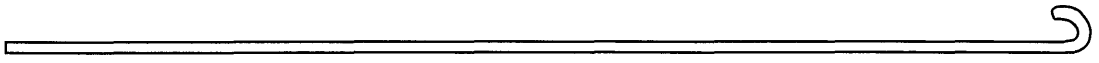


Figure 3. Wire with hook at the end

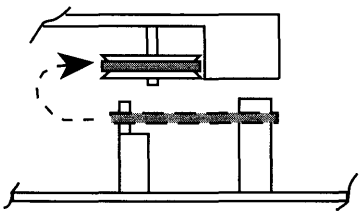


Figure 4. Hook belt onto pulley

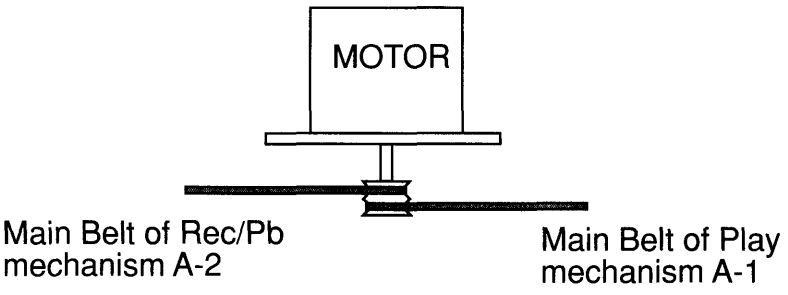


Figure 5. Motor pulley Belt hooking

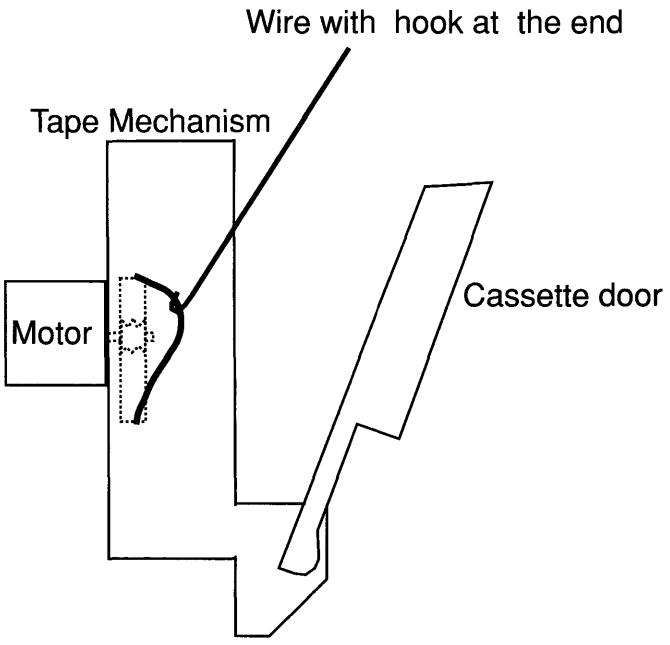


Figure 6. Hooking of the belt onto the motor pulley

EXPLODED VIEW - CENTRE UNIT

023 - 4822 255 40128
200 - 4822 426 51721 - **FW46**
200 - 4822 426 51751 - **FW56**
219 - 4822 450 62199
224 - 4822 413 51467 - VOLUME

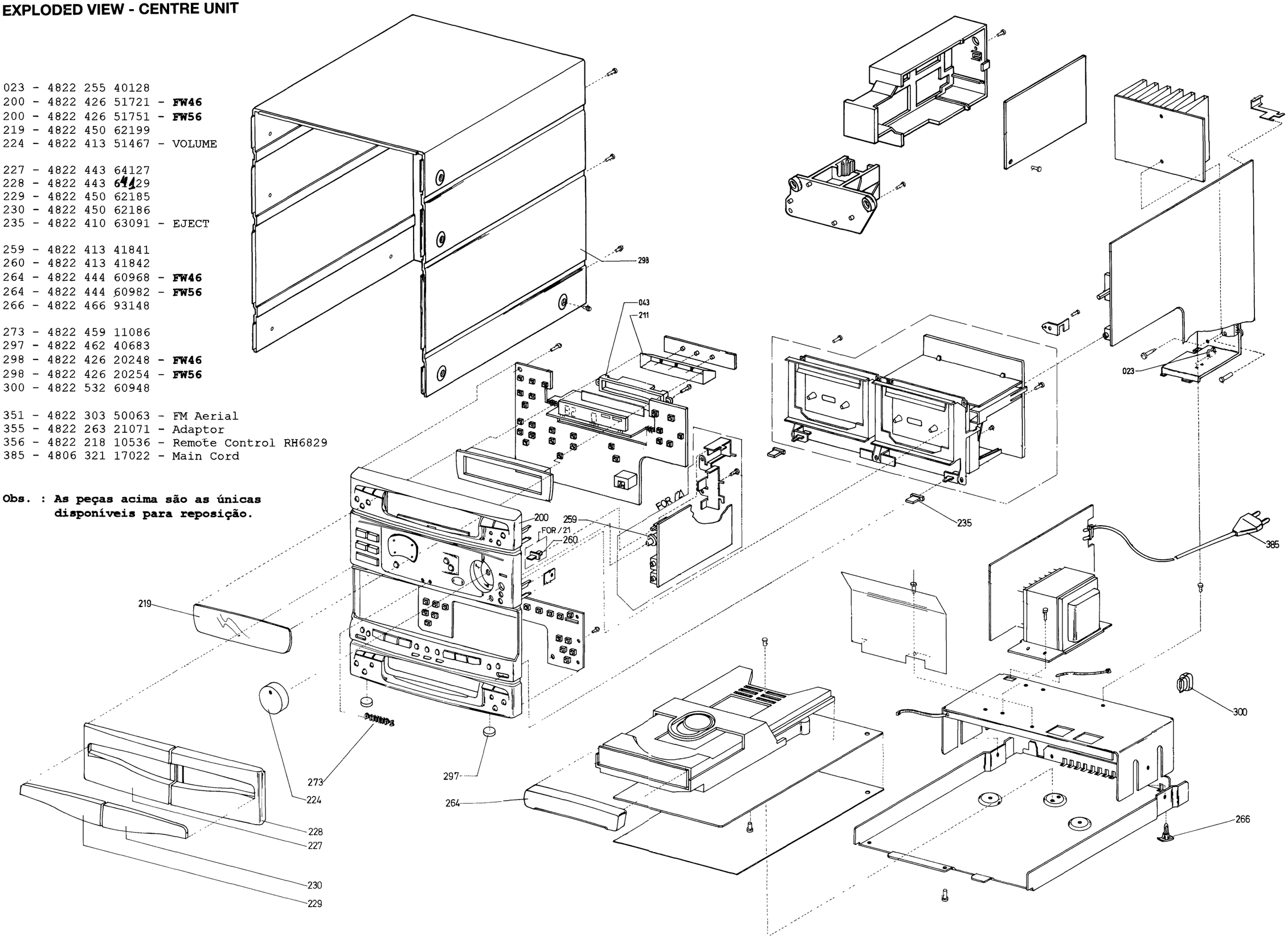
227 - 4822 443 64127
228 - 4822 443 64129
229 - 4822 450 62185
230 - 4822 450 62186
235 - 4822 410 63091 - EJECT

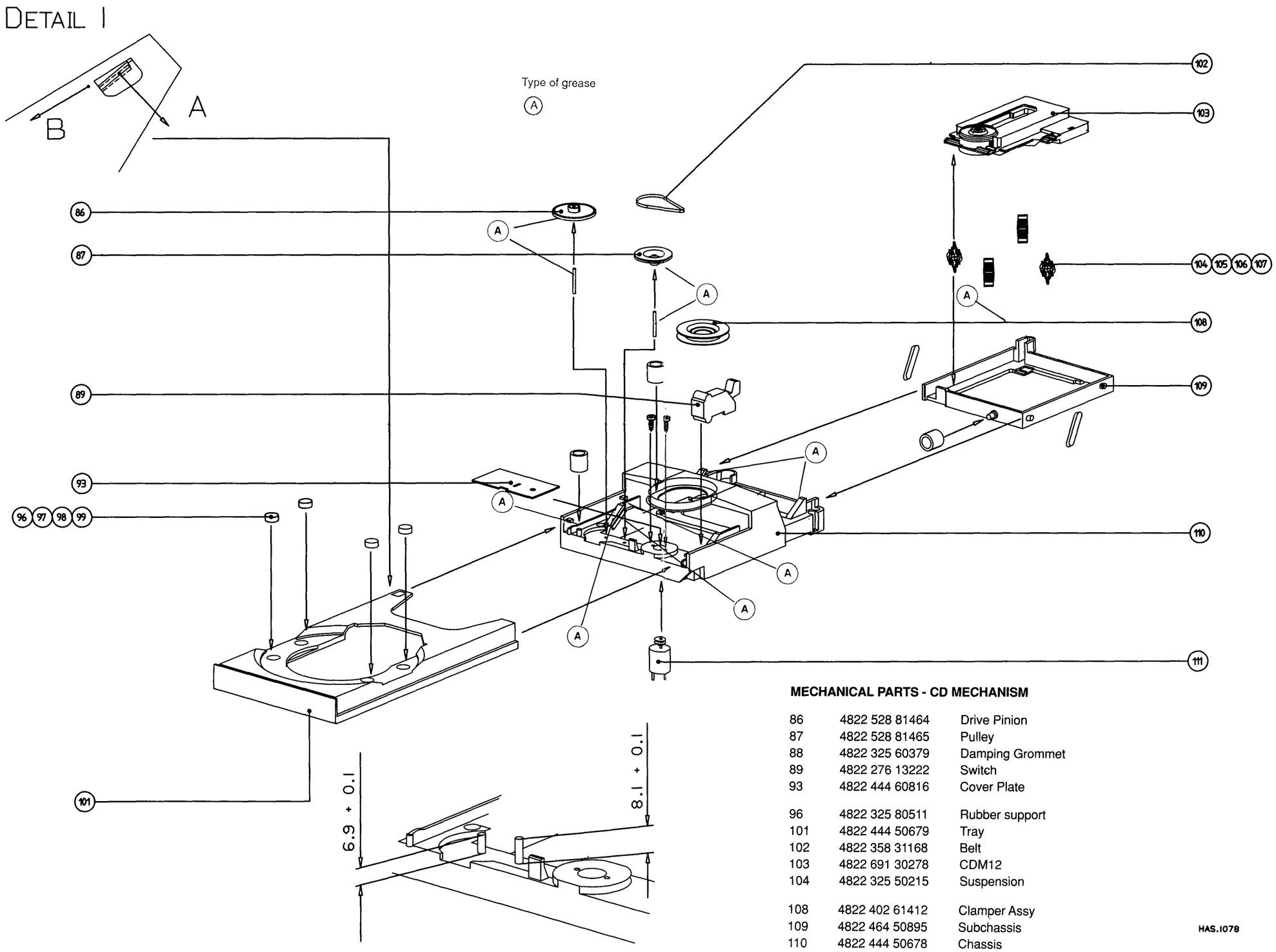
259 - 4822 413 41841
260 - 4822 413 41842
264 - 4822 444 60968 - **FW46**
264 - 4822 444 60982 - **FW56**
266 - 4822 466 93148

273 - 4822 459 11086
297 - 4822 462 40683
298 - 4822 426 20248 - **FW46**
298 - 4822 426 20254 - **FW56**
300 - 4822 532 60948

351 - 4822 303 50063 - FM Aerial
355 - 4822 263 21071 - Adaptor
356 - 4822 218 10536 - Remote Control RH6829
385 - 4806 321 17022 - Main Cord

Obs. : As peças acima são as únicas disponíveis para reposição.





MECHANICAL PARTS - CD MECHANISM

86	4822 528 81464	Drive Pinion
87	4822 528 81465	Pulley
88	4822 325 60379	Damping Grommet
89	4822 276 13222	Switch
93	4822 444 60816	Cover Plate
96	4822 325 80511	Rubber support
101	4822 444 50679	Tray
102	4822 358 31168	Belt
103	4822 691 30278	CDM12
104	4822 325 50215	Suspension
108	4822 402 61412	Clamper Assy
109	4822 464 50895	Subchassis
110	4822 444 50678	Chassis
111	4822 361 21492	Motor

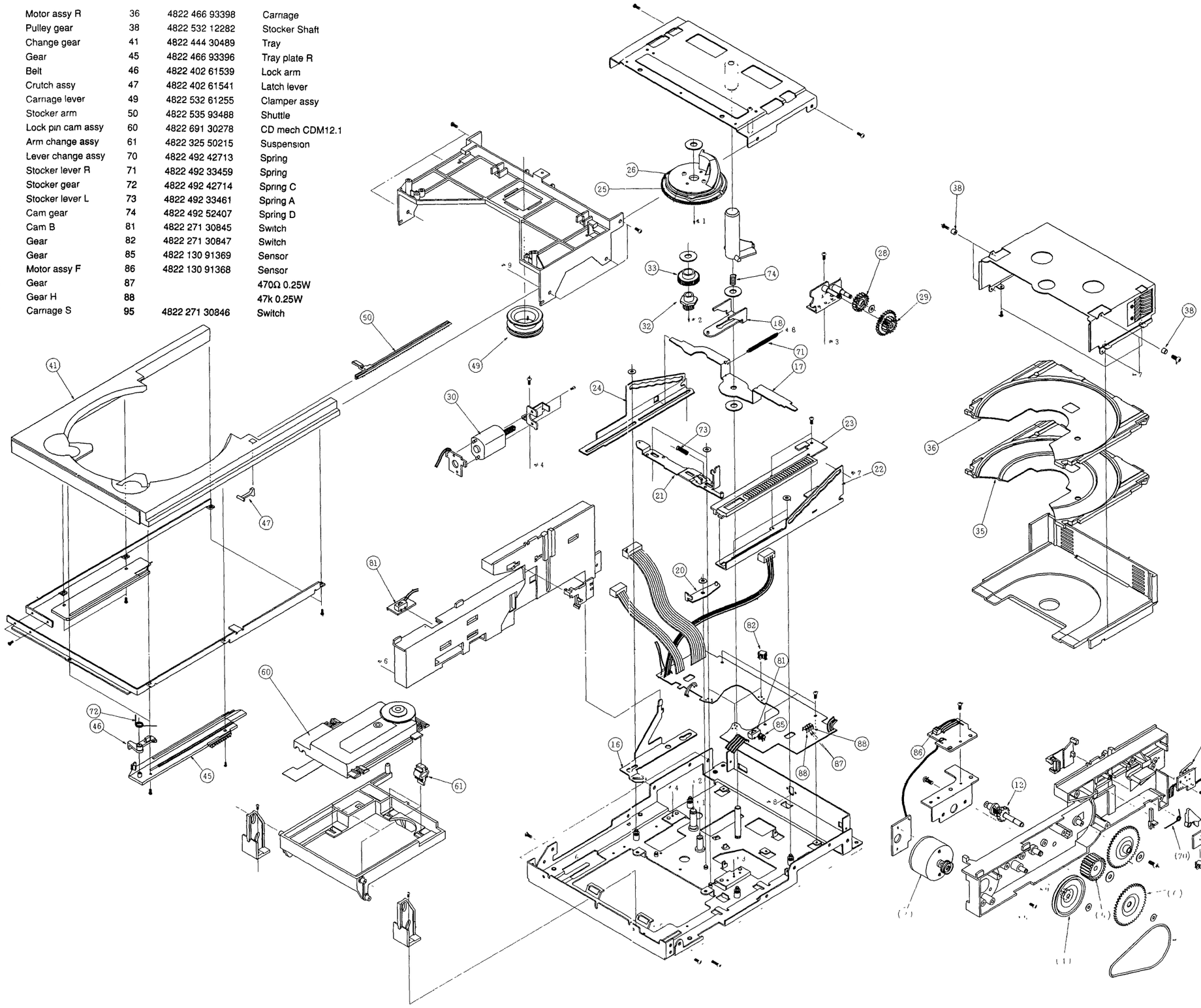
HAS.1078

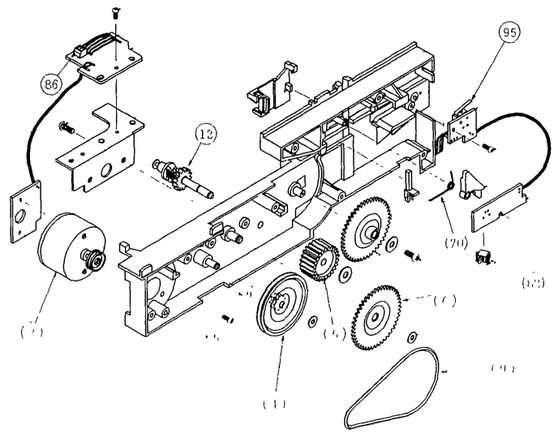
Note: Only the parts mentioned in this list are normal service spare parts.

CDC EXPLODED VIEW FW56

MECHANICAL PARTS - CDC MECHANISM

3	4822 361 21725	Motor assy R	36	4822 466 93398	Carriage
4	4822 528 70861	Pulley gear	38	4822 532 12282	Stocker Shaft
5	4822 522 33484	Change gear	41	4822 444 30489	Tray
6	4822 522 33483	Gear	45	4822 466 93396	Tray plate R
9	4822 358 10148	Belt	46	4822 402 61539	Lock arm
12	4822 522 20457	Crutch assy	47	4822 402 61541	Latch lever
16	4822 402 50316	Carriage lever	49	4822 532 61255	Clamper assy
17	4822 402 50315	Stocker arm	50	4822 535 93488	Shuttle
18	4822 402 61542	Lock pin cam assy	60	4822 691 30278	CD mech CDM12.1
20	4822 402 61536	Arm change assy	61	4822 325 50215	Suspension
21	4822 402 50314	Lever change assy	70	4822 492 42713	Spring
22	4822 402 61537	Stocker lever R	71	4822 492 33459	Spring
23	4822 522 33485	Stocker gear	72	4822 492 42714	Spring C
24	4822 402 61538	Stocker lever L	73	4822 492 33461	Spring A
25	4822 522 33479	Cam gear	74	4822 492 52407	Spring D
26	4822 522 33478	Cam B	81	4822 271 30845	Switch
28	4822 522 33482	Gear	82	4822 271 30847	Switch
29	4822 522 33481	Gear	85	4822 130 91369	Sensor
30	4822 361 21726	Motor assy F	86	4822 130 91368	Sensor
32	4822 522 33476	Gear	87		470Ω 0.25W
33	4822 522 33477	Gear H	88		47k 0.25W
35	4822 466 93397	Carriage S	95	4822 271 30846	Switch

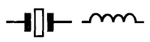




ELECTRICAL PARTS - CDC BOARD

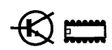
MISCELLANEOUS

1830	4822 071 51601	Fuse T160mA 250V
1850	4822 267 60383	Flex socket 24P
1852	4822 267 60383	Flex socket 24P
8801	4822 321 62522	Flex cable 24P



5860	4822 242 81151	Crystal 16.9334MHz
5861	5322 242 73697	Ceramic resonator 8MHz
5890	4822 242 73557	Resonator 8 467MHz

6857		1N4002GP
6858		1N4002GP
6881	4806 130 37190	BZX79-C3V9
6883	4806 130 37314	BZX79-C2V7



7800	4822 209 30704	MC74HCU04D
7820	4806 130 47332	BC338-40
7830	4822 209 33407	TMP87CC70
7850	4822 209 31064	TDA1301T/N1
7851	4822 209 32852	TDA7073A/N2
7852	4822 209 32852	TDA7073A/N2
7853	4822 209 32852	TDA7073A/N2
7856	4806 130 47227	BC328-40
7860	4822 209 33339	SAA7345GP/M5
7870 #	4822 209 33252	TDA1549T/N1
7872 *	4822 209 32421	TDA1311A/N2
7881		BC558C
7883		BC558C
7884	4806 130 47030	BC337
7885		BC337
7886	4822 209 80891	MC7805CT

For Bitstream versions only
* For Non-bitstream versions only

Note: Only the parts mentioned in this list are normal service spare parts.

7450	**4806 130 47041**	BC548B
7495	5322 209 71555	74HC373D
7496	5322 209 71555	74HC373D
7498	**4806 209 87164**	HEF4094BP

ELECTRICAL PARTS - CDC KEY BOARD

MISCELLANEOUS

1450	4822 276 13114	Tact switch
1451	4822 276 13114	Tact switch
1452	4822 276 13114	Tact switch
1453	4822 276 13114	Tact switch
1454	4822 276 13114	Tact switch
1455	4822 276 13114	Tact switch
1456	4822 276 13114	Tact switch
1457	4822 276 13114	Tact switch
1458	4822 276 13114	Tact switch
1459	4822 276 13114	Tact switch
1460	4822 276 13114	Tact switch
1461	4822 276 13114	Tact switch
1462	4822 276 13114	Tact switch
1463	4822 276 13114	Tact switch
1464	4822 276 13114	Tact switch
1465	4822 276 13114	Tact switch
1466	4822 276 13114	Tact switch
1467	4822 276 13114	Tact switch
1468	4822 276 13114	Tact switch
1469	4822 276 13114	Tact switch
1470	4822 276 13114	Tact switch
1471	4822 276 13114	Tact switch
1472	4822 276 13114	Tact switch
1473	4822 276 13114	Tact switch
1474	4822 276 13114	Tact switch
1475	4822 276 13114	Tact switch
1476	4822 276 13114	Tact switch
1478	4822 276 13114	Tact switch
1479	4822 276 13114	Tact switch
1480	4822 276 13114	Tact switch
1481	4822 276 13114	Tact switch
1484	4822 276 13114	Tact switch
1485	4822 276 13114	Tact switch

	4806 130 37078	1N4148
6459	4822 130 82978	LTL-16KPE
6460	4822 130 83363	LTL-16KGE
6461	4822 130 82978	LTL-16KPE
6462	4822 130 83363	LTL-16KGE
6463	4822 130 82978	LTL-16KPE
6464	4822 130 83363	LTL-16KGE
6465	4822 130 82978	LTL-16KPE
6466	4822 130 82978	LTL-16KPE
6467	4822 130 83363	LTL-16KGE
6468	4822 130 82978	LTL-16KPE
6469	4822 130 83363	LTL-16KGE
6470	4822 130 82978	LTL-16KPE
6471	4822 130 83363	LTL-16KGE
6472	4822 130 83363	LTL-16KGE

MECHANICAL PARTS - CDC MECHANISM

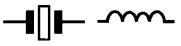
3	4822 361 21725	Motor assy R
4	4822 528 70861	Pulley gear
5	4822 522 33484	Change gear
6	4822 522 33483	Gear
9	4822 358 10148	Belt
12	4822 522 20457	Crutch assy
16	4822 402 50316	Carriage lever
17	4822 402 50315	Stocker arm
18	4822 402 61542	Lock pin cam assy
20	4822 402 61536	Arm change assy
21	4822 402 50314	Lever change assy
22	4822 402 61537	Stocker lever R
23	4822 522 33485	Stocker gear
24	4822 402 61538	Stocker lever L
25	4822 522 33479	Cam gear
26	4822 522 33478	Cam B
28	4822 522 33482	Gear
29	4822 522 33481	Gear
30	4822 361 21726	Motor assy F
32	4822 522 33476	Gear
33	4822 522 33477	Gear H
35	4822 466 93397	Carriage S
36	4822 466 93398	Carriage
38	4822 532 12282	Stocker Shaft
41	4822 444 30489	Tray
45	4822 466 93396	Tray plate R
46	4822 402 61539	Lock arm
47	4822 402 61541	Latch lever
49	4822 532 61255	Clamper assy
50	4822 535 93488	Shuttle
60	4822 691 30278	CD mech CDM12.1
61	4822 325 50215	Suspension
70	4822 492 42713	Spring
71	4822 492 33459	Spring
72	4822 492 42714	Spring C
73	4822 492 33461	Spring A
74	4822 492 52407	Spring D
81	4822 271 30845	Switch
82	4822 271 30847	Switch
85	4822 130 91369	Sensor
86	4822 130 91368	Sensor
87		470Ω 0.25W
88		47k 0.25W
95	4822 271 30846	Switch

MISCELLANEOUS

1101	4822 267 10283	Coaxial Socket 75Ω
1101	4822 265 20598	F-connector Coaxial 75Ω

2100		100pF 10% 50V
2104		100pF 10% 50V
2107		1nF 2% 63V
2110		33pF 5% 50V for LW version
2110		6.8pF 5% 50V
2112		100nF 10% 63V
2114		100pF 5% 50V for LW version
2115	4822 125 60101	Trimmer 3-11pF 100V
2120		470pF 10% 50V
2121		15pF 5% 50V
2122		1nF 2% 63V
2123		1nF 2% 63V
2124		10nF 20% 16V
2129		390pF 1% 160V for LW version
2130	4822 125 50355	Trimmer 4-20pF 100V

3148	4822 100 11163	Trimmer 100k 30% 0.2W



5106	4822 158 60642	Ferrite antenna MW for 2-band version
5109	4806 156 37045	RF Coil 1.5T
5120	4806 156 37045	RF Coil 1.5T
5122	4822 157 60517	Coil 110µH 8% for LW version
5123	4822 157 60517	Coil 110µH 8%
5140	4822 158 60511	AM IF Coil 450kHz
5142	4822 157 70302	AM IF Coil 450kHz
5143	4822 242 70665	Ceramic Filter 10.7MHz
5144	4822 242 70665	Ceramic Filter 10.7MHz
5145	4806 242 77124	Ceramic Discriminator
5150		Coil 1mH 10%
5170	4822 242 72976	Ceramic Resonator 7.2MHz

6105	4822 130 83075	HN1V02H
6109	4822 130 82833	1SV228
6121	4806 130 37078	1N4148 (refer to circuit)
6122		1N4148 (refer to circuit)
6123		1N4148 (refer to circuit)
6124	4822 130 82833	1SV228
6140		1N4148
6154		1N4148
6174	4822 130 34233	BZX79-B5V1

7105	4806 130 47337	2SA838B
7120	4806 130 47316	2SC1047
7140	4822 209 32011	TEA5712T/N2 (RF IC)
7150	5322 209 14482	HEF4096UBT (6 x Inverter)
7156	4806 130 47234	BC337-40
7157		BC337-40
7169	4806 130 47321	BC848C
7170		BC848C
7171		BC848C
7172	5322 209 11517	MM74HCU04M (6 x Inverter)
7173	4822 209 31998	LC7218M (Synthesizer)
7174	4806 130 47269	BC858B
7178		BC858B

Note: Only the parts mentioned in this list are normal service spare parts.

ELECTRICAL PARTS - CD BOARD

MISCELLANEOUS

1002	4822 242 73557	Ceramic Resonator 8.46MHz
1020	4822 071 51601 ⚠	Fuse T160mA 250V
1021	4822 071 51601 ⚠	Fuse T160mA 250V
1570	4822 242 80997	Resonator 16.93MHz
1700	4822 242 72527	Ceramic Resonator 4MHz

6103	4806 130 37078	1N4148
6550	4806 130 37190	BZX79-C3V9

7000	4822 209 31064	TDA1301T/N1
7040	4822 130 60887	BF840
7041	4806 130 47321	BC848B
7042	4806 130 47269	BC858B
7043		BC848B
7044		BC848B
7060	4822 209 72587	TCA0372DP2
7080	4822 209 72587	TCA0372DP2
7101	4822 209 32036	UM6264BM-10L
7102	4806 209 87619	SAA7341GP
7140	4806 130 47322	BC858
7141		BC848
7300	4806 209 87373	NJM4560D
7301		NJM4560D
7500	4822 209 80891 ⚠	MC78M05CT
7550		BC858
7660	4822 209 72587	TCA0372DP2
7700	4806 209 87374	MC68HC05C8/ SERVO-S22

ELECTRICAL PARTS - FRONT BOARD

7401	4822 209 33236	TMP87CM20F
7402	4822 209 31508	ST24C01
7403		HEF4094BP
7410		BC548C
7420		HEF4094BP
7450	4806 209 87279	HEF4051BP
7451	4822 209 31515	BA3830S
7452	4822 209 80797	LM393N
7460		BC548C

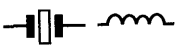
Note: Only the parts mentioned in this list are normal service spare parts.

ELECTRICAL PARTS - FRONT BOARD

MISCELLANEOUS

1401	4822 130 91324	LCD Display
1410	4822 276 13114	Tact Switch
1411	4822 276 13114	Tact Switch
1412	4822 276 13114	Tact Switch
1413	4822 276 13114	Tact Switch
1414	4822 276 13114	Tact Switch
1415	4822 276 13114	Tact Switch
1416	4822 276 13114	Tact Switch
1417	4822 276 13114	Tact Switch
1418	4822 276 13114	Tact Switch
1419	4822 276 13114	Tact Switch
1420	4822 276 13114	Tact Switch
1421	4822 276 13114	Tact Switch
1422	4822 276 13114	Tact Switch
1423	4822 276 13114	Tact Switch
1424	4822 276 13114	Tact Switch
1425	4822 276 13114	Tact Switch
1426	4822 276 13114	Tact Switch
1427	4822 276 13114	Tact Switch
1428	4822 276 13114	Tact Switch
1429	4822 276 13114	Tact Switch

3424	4822 116 90836	Resistor network 5 x 10k
3498	4822 116 90836	Resistor network 5 x 10k
3449	4822 116 90836	Resistor network 5 x 10k
3507	4822 105 11107	Potm Slide 50k x 2
3508	4822 105 11107	Potm Slide 50k x 2
3509	4822 105 11107	Potm Slide 50k x 2
3510	4822 105 11107	Potm Slide 50k x 2
3511	4822 105 11107	Potm Slide 50k x 2



5401	5322 242 73697	Ceram Resonator 8MHz
5402	4822 242 70938	Crystal 32.768kHz
	4822 157 62552	Coil 2.2µH 20%
5404	4822 156 21125	Coil 3.9µH 10%

	4806 130 37078	1N4148
6420	4822 130 82978	LTL-16KPE
6406	4822 214 52009	GP1U58XP

7402	4822 209 31508	ST24C01
7403	4806 209 87164	HEF4094BP
7539	4806 209 87373	NJM4560D

MISCELLANEOUS

1304	4822 267 31176	Loudspeaker Socket
1450	4822 276 13114	Tact Switch
1451	4822 276 13114	Tact Switch
1452	4822 276 13114	Tact Switch
1453	4822 276 13114	Tact Switch
1454	4822 276 13114	Tact Switch
1455	4822 276 13114	Tact Switch
1456	4822 276 13114	Tact Switch
1457	4822 276 13114	Tact Switch
1458	4822 276 13114	Tact Switch
1459	4822 276 13114	Tact Switch
1460	4822 276 13114	Tact Switch
1497	4822 134 41171	Lamp Assy blue
1498	4822 134 41171	Lamp Assy blue
1499	4822 134 41171	Lamp Assy blue
1550	4822 267 40898	Headphone Socket
1551 *	4822 267 40898	Mic Socket
1552	4806 267 37060	AUX/TV Socket
1553 *	4822 276 12571	Vocal Fade Switch

3629	4822 102 10414	Potm 20k x 2 w/motor
3673	4822 101 21204	Potm Rotary 20KA

5313	4822 280 80777	Relay 2P 12V 7A
5373	4822 157 62552	Coil 2.2µH 20%
5374	4822 157 62552	Coil 2.2µH 20%
5630 @	4822 157 50961	Coil 22µH 10%
5631 @	4822 157 50961	Coil 22µH 10%
5632	4822 156 21125	Coil 3.9µH 10%

6250	4822 130 82078	⚠	D5SBA20
6251	4806 130 37078		1N4148
6252			1N4148
6253	4822 130 34173		BZX79-C5V6
6254			1N4148
6255	4806 130 37501	⚠	1N4002
6256		⚠	1N4002
6257		⚠	1N4002
6258		⚠	1N4002

6259	4806 130 37078		1N4148
6260	4806 130 37501		1N4002
6261	4822 130 34233		BZX79-C5V1
6262	4822 130 31631	⚠	BYV10-20
6263	4822 130 31631	⚠	BYV10-20
6264		⚠	1N4002
6265	4806 130 37198		BZX79-C2V4
6266			1N4148
6352			1N4148
6450			1N4148
6451			1N4148
6452			1N4148
6454			1N4148
6455			1N4148
6456			1N4148
6457			1N4148
6504			1N4148
6505			1N4148
6507	4806 130 37053		BZX79-C7V5
6508			BZX79-C7V5
6714			1N4148
6716			1N4148
6719			1N4148
6720			1N4148
6721			1N4148
6724			1N4148
6728			1N4148
6729			1N4148
6730			1N4148
6732			1N4148
6734			1N4148
6735			1N4148
6736			1N4148
6738			1N4148
6739			1N4148
6740			1N4148
6741			1N4148

7250	4806 130 47078		BC548B
7252	4806 130 47066	⚠	BD234
7253			BC548B
7254			BC548B
7255	4806 130 47050		BC558B
7256			BC548B
7257	4822 209 80891	⚠	MC7805CT
7501	4822 209 10263		HEF4052B
7502	4806 209 87164		HEF4094BP

* For Karaoke version only

ELECTRICAL PARTS - COMBI BOARD

7503	4806 130 47045	BC549C
7504		BC549C
7505		BC549C
7506		BC549C
7507	4806 130 47041	BC548B
7508		BC548B
7509		BC548B
7511		BC549C
7512		BC549C
7513	4806 130 47332	BC338-40
7514		BC338-40
7521		BC338-40
7522		BC338-40
7523		BC328-40
7524	4806 130 47227	BC328-40
7525		BC548B
7526		BC548B
7529		BC548B
7530		BC548B
7571		BC558B
7572		BC558B
7575		BC549C
7576		BC549C
7577		BC549C
7578		BC549C
7581	5322 209 14865	MC14066BCP
7582	5322 209 14865	MC14066BCP
7583	4806 130 47153	BC327-40
7630 @		BC549C
7631 @		BC549C
7632 @		BC549C
7633 @		BC549C
7634 @		BC549C
7635 @		BC549C
7636		HEF4094BD
7637		BC549C

@ For Karaoke version only

Note: Only the parts mentioned in this list are normal service spare parts.

ELECTRICAL PARTS - TRAFO BOARD

MISCELLANEOUS

1281	4822 272 10269	⚠	Voltage Selector for -/21 only
1284	4822 071 51002	⚠	Fuse T1A 250V
1285	4822 071 51002	⚠	Fuse T1A 250V
1286	4822 071 51002	⚠	Fuse T1A 250V
1287	4822 071 51002	⚠	Fuse T1A 250V
1288	4822 071 54002	⚠	Fuse T4A 250V
1289	4822 071 54002	⚠	Fuse T4A 250V
5280	4822 146 31377		Mains Transformer FW56
5280	4822 146 31335	⚠	Mains Transformer FW46
5281	4822 157 70003	⚠	Mains Choke Coil

Note: Only the parts mentioned in this list are normal service spare parts.

ELECTRICAL PARTS - ETF3 BOARD

3709			8k2 5% 0 1W
3710			4k7 5% 0 5W
3711			4k7 5% 0 1W
3712			8k2 5% 0 5W
3713			8k2 5% 0 1W
3714			4k7 5% 0 5W
3715			4k7 5% 0 1W
3720			0Ω Jumper (0805)
3721			0Ω Jumper (0805)
3722			470Ω 5% 0 5W
3723			470Ω 5% 0 5W
3724			150k 5% 0 5W
3730			10k 5% 0 5W
3731			10k 5% 0 5W
3732			100Ω 5% 0 5W
3733			100Ω 5% 0 5W
3734			47k 5% 0 5W
3735			47k 5% 0 5W
3736			10k 5% 0.5W
3737			10k 5% 0 5W
3738	4822 100 11771		Trimmer 20k 30% 0 1W
3739	4822 100 11771		Trimmer 20k 30% 0 1W
3740			5k6 5% 0 1W
3741			5k6 5% 0 1W
3742			22k 5% 0 1W
3743			22k 5% 0 1W
3744			12k 5% 0 1W
3745			1k 2% 0 25W
3746			1k 2% 0 25W
3747			1k 2% 0 25W
3748			33k 5% 0 5W
3749			330Ω 5% 0.5W
3760			10Ω 5% 0.1W
3761			10Ω 5% 0 1W
3762	4822 100 11163		Trimmer 100k 30% 0 1W
3763	4822 100 11163		Trimmer 100k 30% 0 1W
3764			33Ω 5% 0 1W
3765			6k8 5% 0 1W
3766			15Ω 5% 0 1W
3767			22k 5% 0 1W
3768			1k 2% 0 25W
3769			10k 1% 0 1W
3770			3k9 5% 0.1W
3771			220Ω 5% 0 1W
3772			10k 1% 0 1W
3773		△	4Ω7 5% 0.33W
3774			22k 5% 0 5W
3780			8k2 5% 0 1W
3781			6k8 5% 0 5W
3782	4822 100 11319		Trimmer 4k7 30% 0 1W
3783	4822 100 11319		Trimmer 4k7 30% 0 1W
3784			4k7 5% 0.5W
3785			1k 2% 0 25W
3786			1k 2% 0 25W

5650 *	4822 156 21725	MPX Filter
5651 *	4822 156 21725	MPX Filter
5652	4822 156 20811	Coil 36mH 5%
5653	4822 156 20811	Coil 36mH 5%
5730	4822 156 20811	Coil 36mH 5%
5731	4822 156 20811	Coil 36mH 5%
5760	4822 156 20946	Osc coil 100kHz
5780	4822 242 72527	Cer Resonator 4MHz
5790		Coil 100µH 10%

6650	4822 130 34233	BZX79-C5V1
6760	4806 130 37041	BZX79-C10V
6780	**4806 130 37501**	1N4002
6781		1N4002
6782	**4806 130 37078**	1N4148
6783		1N4148
6784		1N4148
7650	4822 209 32919	HEF4952BT
7652	**4806 130 47321**	BC848C
7653		BC848C
7654		BC848C
7655		BC848C
7656		BC848C
7657		BC848C
7700	4822 209 32919	HEF4952BT
7701	4806 209 87486	UPC1330HA
7702	4822 209 32918	AN7318S
7703	5322 209 11102	HEF4052BT
7730	4822 209 31505	CXA1298AP
7760	**4806 130 47332**	BC338-40
7761		BC338-40
7762	**4806 130 47078**	BC548C
7763		BC548C
7764	4822 130 42682	DTA144ES
7765	4822 130 60588	DTC114ES
7780	4806 130 47227	BC328-40
7781		BC328-40
7782		BC328-40
7783		BC848C
7784		BC848C
7785		BC848C
7786	**4806 130 47269**	BC858C
7787		BC848C
7791		BC848C
7792	4806 209 87639	MC78L05ACP
7793	4822 209 12612	MC68HC05C4P

* For Dolby B version only
\# For Non-Dolby version only

Note. Only the parts mentioned in this list are normal service spare parts

Anotações para alterações técnicas